

THE BRICKBUILDER

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CHURCH OF THE HOLY APOSTLES, ATHENS

Alternating courses of brick and stone, with panels of cut brick flush with mortar. Built about the fourteenth century.

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Practical Details in Hospital Planning and Equipment. — Part I.

BY M. E. McCALMONT, R.N.*

FOREWORD.

THE purpose of this series of articles, already announced by the editors of THE BRICKBUILDER, is to put before architects and others interested in hospital construction, not so much the technical details which can be found in abundance elsewhere, but the practical facts and ideas of which it is necessary to have an understanding if our hospitals are to be something more than delightful examples of architecture.

Allusions to problems and details of organization and management may seem, at first thought, extraneous or irrelevant, but the close relationship of such subjects to successful hospital planning can best be determined by the results obtained in those institutions where such factors have been duly considered and those wherein they have not.

We learn by error as well as by good example, consequently the unhappy mistakes of the past have been used by way of illustration, though just as great an effort has been made to exemplify the happier trend of the present.

There is little virtue and less sense in clinging to the traditions and customs of the past, if we cannot, by so doing, satisfy the needs of the present. It is quite universally acknowledged that our existing hospitals typify many glaring evidences of ignorance of actual hospital needs, viewed from the standpoint of patient and worker.

Just as unmistakably as our hospital administrators are arriving at the conclusion that their duty to the patient is not fully discharged the moment he leaves the hospital roof, convalescent, just so surely are we coming to the conclusion that hospitals are not successfully planned and built until due consideration has been given to the physical comfort of the patient as well as to the convenience of the employee; that an institution has not been economically or satisfactorily built unless it can be economically administered.

The future test of successful hospital planning will be, we believe, simple, artistic architecture; sanitary and sound-proof construction; but quite as important as these, practical planning which ensures the maximum of comfort and efficiency with the minimum of effort and waste.

HOSPITAL PLANNING. GENERAL CONSIDERATIONS.

To successfully plan a hospital in these exacting days, when cost is no longer computed solely in dollars and cents, but more and more in terms of human efficiency, with conservation of human energy as a measuring test, is a very different matter than in the easy days of not so long ago when hospital committees were content with a group of beautiful buildings not exceeding in cost the original sum specified, bothering their heads but little with cost of future maintenance, convenience of management, comfort of patients, or any of the other perplexities that to-day make hospital planning a science in itself far more complex than any other field in the architect's world.

We know that for years to come hospitals will be constructed as in the past, but we rejoice to see that there is an increasing number of persons in the field who are conscientiously making a study of this work. We note with pleasure that the young architect, tackling his first hospital commission, no longer goes at it with the assurance of inexperience, devoting his chief energies to covering up his ignorance of hospital matters, but is more and more inclined to confess his inexperience and welcome consultation with, and assistance from, those who have made, or are making it, their life work and study.

The architect with his first hospital commission has a rough way to travel. Generally his building committee is as ignorant of hospital needs as he. The doctors will have fifty-seven different varieties of opinions on as many different problems, many of them conflicting, most of them impractical, not a few unduly extravagant, yet to all he must lend a patient ear and acquiescent mind, — or lose his clients.

There are two courses open — one, to please as many as possible, build as fine an architectural monument as is financially within reach, trusting to luck that it will "work"; the other, to proceed intelligently, studying conscientiously the past history of the hospital, the present needs and the *future expansion*; insisting that as much as possible of the organization be determined before the plans are begun, that a definite personnel be provided for; asking that a tentative budget be considered, taking stock, as it were, of available maintenance funds, that a building or group of buildings be not erected so costly from the standpoint of operation and management that the future

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could not possibly be other than a weary struggle with debts and annual deficits.

To which the architect may answer, "That is no concern of ours. We have troubles enough. It is our business only to give the committee and doctors what they want, to build them as good a looking structure as is possible for the money available, one that is fireproof and sanitary, one that is (if this be not his first experience) sound-proof, and one that is (this, if he has planned several or more) easy to keep clean."

With such an attitude, we can only expect the usual result, an institution with a wonderful operating suite, but with inadequate eating and living quarters for the employees; with enough plumbing to take care of twice the number of patients, but with no sink closets for the proper care and accommodation of ordinary mops and brooms; with an expensive ventilating system that makes a good talking point for the hospital, but fails to ventilate; vacuum cleaning systems that are not used; miles of needless steps to be traversed which could have been avoided by a little study of hospital management, and a consequent concentration of administrative area; beautiful sun parlors for the patients, but not a spot in which to air and sun a mattress; wonderfully equipped laundries, but without a facility for the proper washing and drying of blankets, and so on, and so on. These are the things that make a hospital worker heart-sick because of their needlessness. To be sure it is "the easiest way" for the architect, and he may be able to repeat it indefinitely, but the man who is out for lasting reputation, particularly for him who expects to specialize in this sorely neglected field, the other way is preferable.

A preliminary study of the situation is a necessity: The size and character of the community; its rate of increase for the past two or three decades; its probable future growth; its industries and manufactures, wealth and poverty; other hospitals in the community, their growth and patronage; the political situation, how related, if at all.

The foregoing are all-important factors in the subsequent administration; the connection between the planning and future management of an institution is too close to be ignored by the architect, provided he be working for an intelligent result.

Other considerations are not only the funds available for building, but the funds available for maintenance, whether from endowments, donations, State aid, or from fees.

The initial construction, future expansion, cost of maintenance, and earning capacity, are all so interdependent that to consider them separately, *or not at all*, can only spell future trouble for the hospital administrators.

Did we not know it to be done so frequently we would think it impossible to plan such an institution without a fairly exact knowledge of the organization and personnel for which it is supposed to provide; the nature of the cases to be cared for, and many other obviously pertinent factors.

To illustrate the first point, a new hospital known to the writer had been planned and built for three times the capacity of the old one which was to be abandoned. Yet provision had not been made for other than the existing personnel. It would seem incredible that a committee

could plan for an increase of three times the capacity of the hospital with no increase in staff, yet these, and like mistakes, are constantly being encountered in our new hospitals.

In another recent construction, before the installation of plumbing fixtures, it was noted that no provision had been made for typhoid sterilizers. The architect had been told that typhoid cases were not to be admitted. The matter was at once referred to the directors, and after much vehement discussion it was decided that the hospital could not consistently refuse to accept typhoid, and, therefore, provision must be made for its proper care.

There are few general hospitals which are not required, sooner or later, to care for typhoid, venereal diseases, delirium tremens, mental cases, etc. Every hospital pretending to be general in character should be prepared to care for such. The actual cost of not being so prepared, and the serious menace involved to patients, nurses, and employees, is far out of proportion to the initial cost of construction and equipment. Adequate facilities for sterilization and disinfection in typhoid cases; roof or open air accommodations for pneumonia; sound-proof rooms with guarded windows for violent delirium or mental cases; special wards and rooms for venereal diseases, with linen and china distinctly marked and all utensils kept apart from other patients. It is folly for hospitals to say that they will not accept such cases. In many instances, admittance is imperative; in many others, these cases develop while in the hospital, though admitted for widely different reasons. It is obviously the duty of general hospitals to be so constructed and equipped, and wise is the architect who advocates such provision.

In the building of every hospital there are three groups of persons who should be particularly considered: the patients, the official staff, and the doctors. It is believed that these groups are named in the proper, though perhaps unusual, order of precedence. Generally we find it reversed, and it is seldom that there is more than one group represented on the building committee. Therefore, it behooves the architect to study the question independently; first from the viewpoint of the patient. This can well be done by consultation with some of his friends who have one time or another been hospital patients. He will be surprised at the ideas which will be given him, probably in the way of complaints of unnecessary hardships previously encountered, possibly in the way of praise of various excellent features which particularly appeal. Certain it is that no thinking person can leave a hospital as a convalescent patient without some ideas that would be of value to the architect. From one he may learn that patients would greatly appreciate having the windows built low enough to enable them to see out when reclining in a chair during their first days of convalescence. From another he may learn that it is quite possible and altogether desirable to so arrange corridor lights that they will not shine directly through a transom into the patients' eyes. Yet another may call his attention to the great comfort of the so-called bar-room door which makes possible perfect ventilation in the summer time, or at night, yet screens the private room from the curious gaze of those passing through the corridor. Another will warn him that elevators should be built into sound-proofed shafts, — another that the kitchen must be so located as to absolutely keep

the odors from the hospital proper. Some of the suggestions may be irritatingly obvious, yet he will doubtless find most of them based upon actual and distressing experience.

Every one has his or her viewpoint, and it is the business of the architect to study and analyze the ideas of all those ultimately concerned in the institution which he may be planning.

As we have put the comfort of the patient as the most important consideration in the hospital plan, so have we made second the convenience of the hospital staff, the workers of the hospital, those who live day in and day out in the midst of its trials and exasperations, its joys and its griefs, its comedies and its tragedies. I sometimes wonder whether they should not be made first.

Certainly everything should be done to facilitate the work of the busy superintendent. Living quarters cannot be made too livable for one whose life work is in the hospital field; whose years are spent within hospital walls. And quite as true should this be of that terribly overworked, self-sacrificing woman, the superintendent of nurses. It is curious and somewhat discouraging to note how often her comfort and convenience is overlooked. It is not yet the rule that she has a sitting room and bath of her own, while her office is, more often than not, a mere makeshift. Not long ago the writer was in one

of the largest and most lauded of our Eastern hospitals and found the superintendent of nurses without a telephone in her office. Quite a considerable distance had to be traversed to the nearest available one. The installation had been "promised" for over a year, but not accomplished.

Of all hospital officials, there is no one whose convenience or comfort should be more carefully considered than hers. There is perhaps no one from whom the architect should be able to get more practical ideas concerning almost every phase of hospital planning; how comfort can be secured; how human energy can be saved; how general efficiency can be attained. Wise is he who avails himself of this "working" knowledge.

So also the heads of each department. Their comfort and convenience means efficiency and economy for the hospital. It is therefore a matter of moment that the dietitian should have desk room near her diet kitchen and storeroom; that the matron should have the sewing and mending room in the closest proximity to the laundry; that the pharmacist should have his supply room adjoining his drug room, or directly beneath it, communicating with a circular staircase.

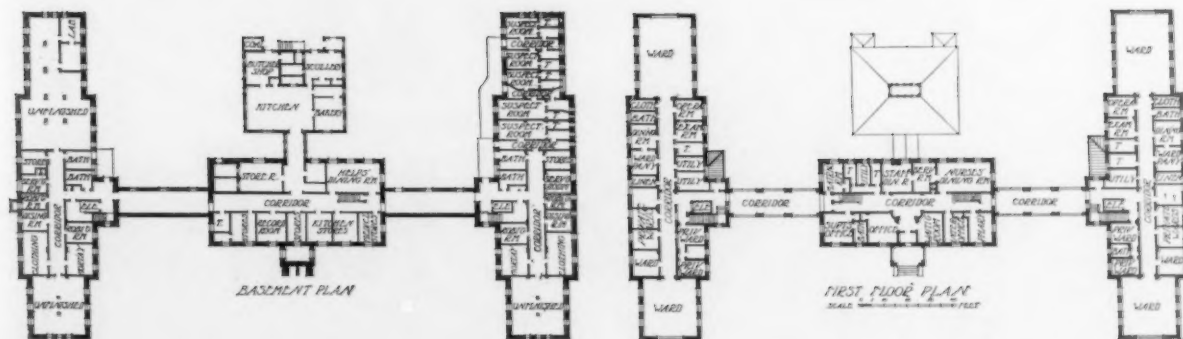
These and similar details are of major importance to the individual heads of departments, but ultimately of equally as great importance to the hospital administrators.

(To be continued in THE BRICKBUILDER for July.)



WEST DEPARTMENT
OF THE
MASSACHUSETTS
HOMEOPATHIC
HOSPITAL.
BRIGHTON, MASS.

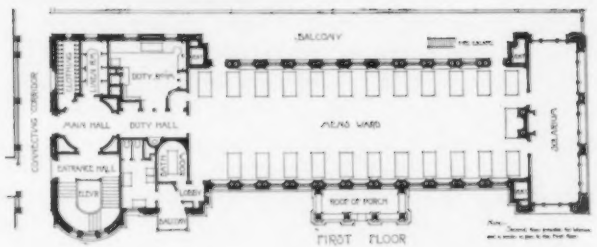
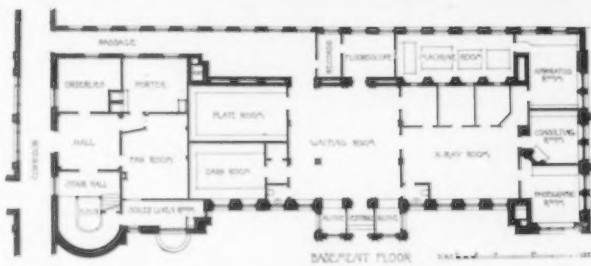
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The Planning of a Young Men's Christian Association Building.—Part III.

BY LOUIS ALLEN ABRAMSON.

THE activity that is being manifested in educational and social circles to combine means for the physical with that for the mental development can be properly accredited to the Young Men's Christian Association, for it realized, at its inception, the potency of exercise under wholesome environment, as a necessary accomplice to its religious and educational endeavors. And so, the physical department of the Y. M. C. A. has within the past decade undergone a complete revolution. As more and more serious analytical study is given by those to whom the work is entrusted, orthodox and trite theories are being discarded, and more radical and efficient forms are observed. All this has come about since the leaders in the association work have made the architects cognizant of the fact that the ostensible purpose of the physical department, that is, the gymnasium and auxiliary rooms, natatorium, shower and locker rooms is not solely to give physical training, but must serve as an efficient instrument for moral, educational, and physical culture.

Standards have been adopted, and undoubtedly time and further thought will develop and perfect details, but the relative placement of the rooms as now adopted will remain until such times as the present system of administration will be altered.

Unfortunately, however, we find comparatively too many recently completed association buildings of the type and magnitude of which these papers are treating in which the relationship of the different rooms comprising the physical department have been devised, but with absolute disregard to the primary elements of association architecture. Such dereliction upon the part of the architect is unpardonable, for good examples are abundant and are accessible to all.

In the planning of the physical department the factor of "direct circulation" becomes the major consideration, and failure to take cognizance of this fundamental principle has

been the pitfall of the architect and the failing of too numerous structures. Elsewhere within the building direct circulation is desirable only as a convenience and to avoid trespassing. But here it means altogether something more serious, as will be seen. To better understand, let us digress from the "ideal" and consider the altogether too "common." Fig. I diagrammatically represents the physical relationship and indicates the line of circulation that frequently exists in otherwise commendable buildings. Member A (whether junior or senior) enters his locker room, dons his gymnasium suit and immediately goes to the gymnasium. After his exercising he returns, undresses, has his "soap up" and the compulsory shower, and crosses the hall to the pool. In his circulation from the shower to the pool his dripping body leaves a trail behind him. He emerges from the pool, again enters the hall, water running from his body, not having taken care to dry himself, and makes for the locker room, and after dressing goes elsewhere in the building. Member B immediately follows and from his locker room retraces the line of circulation of Member A into the hall, the floor of which is quite naturally wet, and, in passing, the soles of his gymnasium shoes add dirt to the accumulation. And in reaching the gymnasium, unavoidably, and with damaging results, draggles mud with him onto the floor. Finally, in crossing from the shower room to the pool, the soil is brought into the natatorium and carried on the soles of his feet into the swimming pool. Multiply the circulation of and effects caused by Members A and B by the attendance per day, and the cause of the damaged gymnasium floor, untidy basement, and constantly dirty swimming pool, and the general dilapidated appearance of many buildings, is manifest. The remedy is a most simple one and, if study is given so as to make "cross circulation" impossible and not elective, the problem is solved. Note circulation in Fig. II.

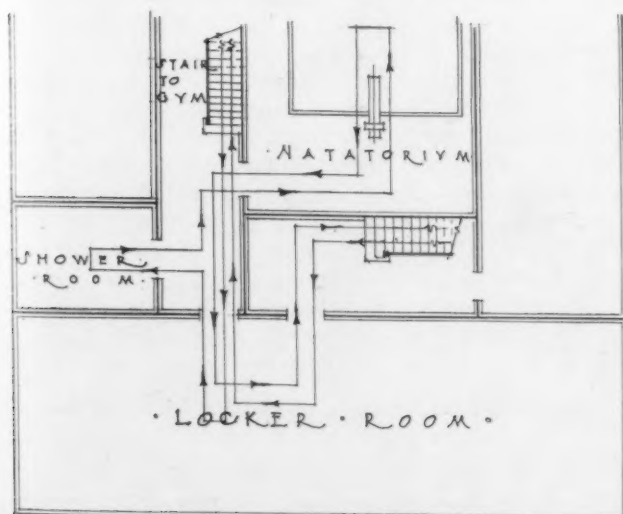


FIG. I.

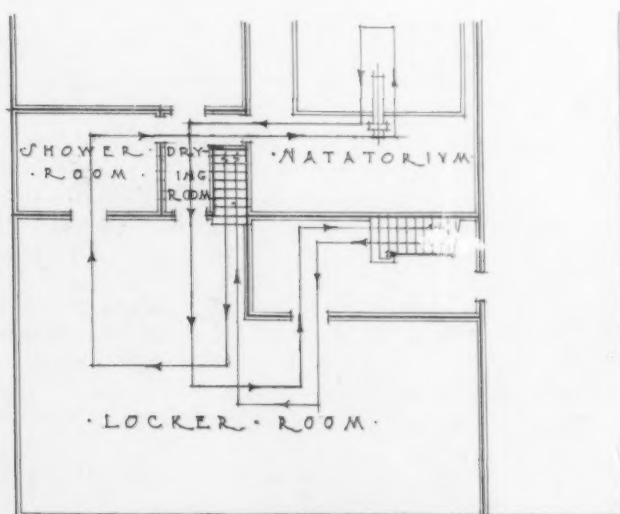


FIG. II.

The foregoing analysis is equally important for both junior and senior departments and is as necessary in one as it is vital to the other.

In the moderately sized building, it is seldom possible to assemble the entire physical department on any one story; obviously the ideal arrangement, from the view-point of supervision and direct circulation. Assuming then that the rooms of the department must be divided among several stories, the distribution and relationship of the rooms should be such that the circulation will be direct and the distance traversed reduced to a minimum. This should be especially so in the circulation from the locker room to the pool, via the shower room, at which time the member exposes his overheated body and makes himself susceptible to cold.

The relationship of the units having been tentatively established, we shall consider them separately.

Locker Rooms. The direct accessibility of the locker rooms is a matter of serious consideration. Especially is this so in the case of juniors. For them, if it can be so planned, their locker room should be but a step from the point at which they leave the supervision of their secretary.

Juniors and seniors should be segregated and it is advisable to further subdivide the senior locker room so that the older men, whom we shall hereafter refer to as the business men, shall not be compelled to mingle with the less serious minded and at times mischievous youths, at the moment when the latter are most capricious. The entrance to the junior locker room should be from within their own department, but it is advantageous to compel the business men to pass through the senior locker room. In this manner the senior, aware of the possible presence of his elder, will keep within stricter bounds of propriety. The locker room in reality should be but one room divided into sections; the actual division being a row of lockers of the usual height and wire mesh or wired glass arranged in removable panels above. Such an arrangement will most readily permit of a reapportionment of the capacity of the sections as the several memberships fluctuate from time to time. It is advisable to locate the seniors in the middle section so that the frolics of the boys will least disturb the older men. When determining the capacity of the locker space, it is incumbent to allow for a twenty-five per cent expansion in membership.

Provide for an abundance of natural light and ventilation as these are vitally necessary. If lacking, whatsoever other virtues the room might possess, its usefulness will be hindered and its influence negative.

There are several systems of locker storage in operation. (Fig. III.)

(A) The simple straightforward "ordinary" long passed the speculative and theoretical stage. (B) The more modern "Kansas City Plan" and the most recent (C)

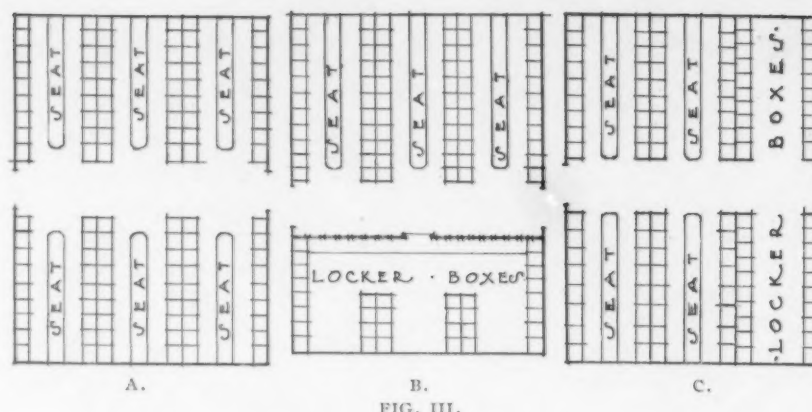


FIG. III.

as follows. In (A) a locker is provided for each member holding membership entitling him to the locker privileges. The member has absolute right of occupancy and keeps his gymnasium clothes and accessories in it at all times except when he is using the physical department. Then his locker serves as a storage for his street apparel. In system (B) a membership carries with it possession of a box or wire basket, approximately 8 x 12 x 8 inches deep, which serves as a receptacle for his gymnasium suit, toilet articles, etc. In operation the member applies to the attendant in charge of the locker room for his basket and is assigned to a locker, the key of which is given to him. He disrobes and places his clothing and emptied basket in the locker and passes to the gymnasium. *Comparison.* In system (A), if the membership is one thousand, it is necessary to install as many lockers albeit the maximum attendance at any one time may be but one hundred. If system (B) were to be employed, one thousand baskets need be provided and but one hundred lockers, a sufficiency to accommodate the maximum single attendance.

In system (C) the same proportion of lockers and baskets are required, but instead of having the baskets under the charge of an attendant, they are filed in racks of compartments each large enough to hold the baskets and each under lock. In operation the member removes the padlock (which can be of the keyless type) from the compartment containing his basket and possessions and carries them to any locker which he finds not in use. He disrobes, placing his street apparel and basket in the locker, and secures it with the same padlock. *Comparison.* System (C) eliminates the necessity of employing an attendant; is most economical in space; the carrying of keys and the possibility of their loss is eliminated and it makes each member personally responsible for his own effects.

The following is the ratio of floor area in square feet per member required respectively by the several systems. The figures are based upon an average attendance in proportion to a fixed membership.

	Junior	Senior	Business Man*
A	1.5	3.0	4.5
B	0.66	1.0	1.33
C	0.63	0.87	1.0

The above figures are based on the following dimensions: All lockers 144 square inches, in sectional area. In the junior locker room they are arranged in double

*Dressing booths in the proportion of six to every one hundred members are provided for the business man. The advisability of providing this feature is dependent upon the type of membership.

"Modified Kansas City Plan." Data as to the different methods of operation of the several systems, some of which are controlled by patent rights, can best be procured through the manufacturers. Concisely, they may be described

tiers, all others single tier with the aisles between lockers 3 feet 6 inches in width.

Ignoring all other factors, pro and con, it would appear that system (C), for economic reasons, should be adopted unqualifiedly; but still, under certain environment, the other systems possess superior attributes. What would serve splendidly in the North might be decidedly bad in Florida, and a perfectly serviceable plant for a wealthy residential community would be doomed to failure if attempted in an industrial center. For example, in a manufacturing community, where the membership would be composed of men and boys, a large percentage of whom would be proletarian and who would not possess the propensity towards cleanliness, the installation of system (C) would be absolutely absurd. One can imagine the perspired gymnasium suit, crumpled and locked in a repository and used perhaps but once a week and laundered not too often. It is obvious that system (A) is by far superior here, as the members' clothes would at least be hung and permitted to air. But system (B) would have its incontestable advantages, for, as the members' baskets are returned to the attendant, he can at a glance see if the member's suit is in condition to be again worn, or if the association maintains its own laundry service, the garments can be washed and sterilized and returned to their respective baskets between sessions.

In designing any building in which the plan of the floor containing the locker rooms is such that there are other activities, which require supervision and control, namely, bowling alleys, billiard room, etc., then an attendant should be provided at a focal point, who can distribute the baskets and operate system (B). In addition he should collect fees for the use of the different privileges, distribute towels and soap, and thus relieve the main desk of these inconveniences. He also should supervise and control the locker room and swimming pool.

When determining upon the locker system to be employed, the following factors should govern the choice: (a) type of membership, (b) climatic conditions, (c) plan of floor, (d) area available.

Gymnasium. The gymnasium, when active, is one hundred per cent noise of the piercing variety, and so its location in the plan should not be such that it will become necessary to curb its activity to spare other departments. The room being enclosed in brick walls, or walls of other sound-resisting material, it is manifest that the transmission of sound (not vibration due to impact) is greatest through windows, roof openings, and doors. The

gymnasium, consequently, should never be planned for at the base of a court and neither should the windows open upon a court or shaft facing the main building proper. The doors leading to the gymnasium generally are those from the locker rooms, the physical director's offices and spectators' galleries, and these must be so arranged that any possible reverberation will not be communicated directly to any room where it will constitute a disturbing element.

The gymnasium and its related rooms should be planned so that they will lend themselves for diverse usages; for recreative games, for gymnastics, and finally for large assembly purposes. As a gymnasium pure and simple the room need not have any particular form, granted, of course, that its dimensions are ample. As a room in which the prevailing popular games, such as indoor baseball, basket ball, and track sports may be efficiently and sufficiently accommodated, it need be of certain proportions, 42 feet in width and 60 feet in length being the minimum dimensions, while 50 feet by 75 feet is considered ideal. Variations, when made, should not alter the proportion. In height the room should not be less than 22 feet to the lowest point of the roof trusses and not less than 9 feet and preferably 11 feet to the under side of the running track gallery.

Running Track. The width of the running track should be about 6 feet from the center of the outer rail to the wall. This width makes the passing of runners possible with little fear of interference. As a spectators' gallery, it will allow a row of seats against the rail and leave ample passage. If it is contemplated to frequently adapt the gymnasium as a place of assemblage, then the means of ingress should be at the side rather than at the ends where the incline is most steep and dangerous. Sliding poles and ladders should lead from the track to the gymnasium floors, but it is advisable to recess and so place them where their presence will not be dangerous. The wells should be devised so that they can be closed to prevent trespassing at public occasions. Radiators should be placed out of reach and, where additional radiation is placed under the track, the latter should have narrow registers or chases in the floor close to the wall, so that the warmed air will not rise at the front of the gallery to the discomfort of the spectators at the rail.

The windows in the gymnasium should be well distributed on all available walls extending down to not less than within six feet of the floor on the side walls and to the track level on the

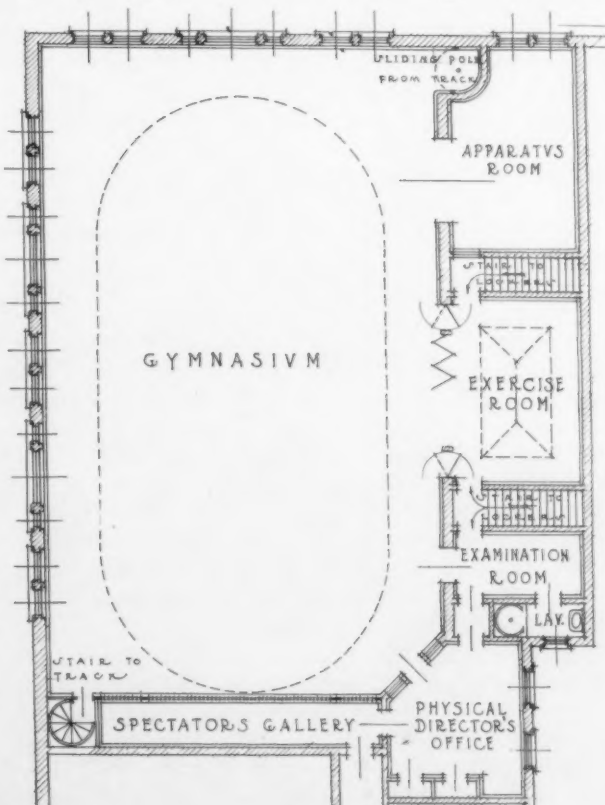


FIG. IV.

ends; leaving these walls for hand ball play. All windows and as a matter of fact all sash opening into the gymnasium must be provided with wire screens fastened to each sash where they are movable.

Exercise Room. A valuable and necessary auxiliary of the gymnasium is the exercise room, to be used when the gymnasium is assigned for class work, tournaments, etc., and consequently inaccessible for individual exercise. Here will be found the punching bags, pulley weights, equipment for calisthenics, etc. A room 15 feet by 25 feet with a ceiling not less than 13 feet in height is serviceable.

Apparatus Room. A room about 12 feet by 15 feet should be placed immediately adjacent and central to the gymnasium as a storage room to accommodate the gymnasium equipment. Here will be kept all possible movable apparatus, including mats, at occasions when the gymnasium is to be used as an auditorium or when games occupy it. It should be connected with the gymnasium by an opening not less than 10 feet and wide enough so that the handling apparatus can be easily accomplished.

The entrances to the gymnasium should be as indicated in Fig. IV, that is, through the exercise room. The advantage of such an arrangement is significant, as it eliminates a condition that is extremely annoying to the physical director, for should the entrance be directly into the gymnasium, it will be found that members will rush pell-mell into the room unconscious of the fact that a class is being instructed or that a game is in progress. A rolling shutter or the folding doors, indicated, separating the rooms, when closed will permit of conscientious class work by eliminating the sources of distraction in the exercise room.

Physical Director's Offices. The physical director's offices should command a clear survey of the gymnasium and as much of the running track as is possible. Not so much is this arrangement necessary for the detection of misconduct as it is to allow the director to casually see from his office that his leaders are properly directing their charges. His offices should be composed of an examining room not less than 8 feet by 10 feet with a shower room containing a lavatory opening from it, and his working office facing and with entrance from the gymnasium. This room should contain a fairly large closet in which will be kept such gymnasium appurtenances as basket and medicine balls. There should also be an additional closet for the use of the instructor as his wardrobe.

The ostensible function of the physical director is, as his title implies, to properly direct physical development. His office should be situated as indicated in Fig. IV, for with a positive command of the spectators' space, he can espy the frequent and interested looker-on and can advise with him when necessary. The spectators' space, sufficiently large to accommodate twenty to thirty, should be within convenient distance of the lobby.

Shower Rooms. To guard against the possible contamination and consequent spread of disease, the association compels each member to bathe himself preliminary to his entering the swimming pool. For this must be provided shower rooms leading from each locker room and immediately adjacent to the natatorium. The showers should never be within the natatorium itself as the resulting presence of steam and noxious odors becomes disagreeable. Concentrating the shower rooms as indicated in

Fig. V presents an arrangement that is most economical, flexible, and simple of administration. It achieves equal results with a lesser number of showers than if the junior and senior shower rooms were disconnected and located at a distance from each other. In the operation of the physical department each class of membership has access to the swimming pool and gymnasium only during definite hours, though the locker and shower rooms may be available to all during these same times. And so by locking the door between rooms B and C during the senior session the showers in rooms A and B are at their disposal and the showers in room C (an ample number for other than class times) are accessible to the juniors. Similarly, by closing the door between rooms A and B during the junior session, then they can use the showers in rooms B and C while the seniors have access to room A. After special events in the gymnasium, at which time the members of one department only are admitted and then in extreme numbers, the usual allotment of showers for that department is always inadequate; but with the arrangement indicated it is possible to press into service the bath rooms of both departments without necessitating or permitting circulation through any other than the one locker room.

In the senior shower room, each shower bath should be within a separately enclosed stall, with the controlling valves and soap receptacles on the sides rather than at the back, as is common. In the junior shower room, seventy-five per cent of the showers should be within one large compartment, with one controlling valve to be operated by an attendant who will regulate the quantity of water supplied and its temperature. The shower rooms should be wide and sufficient in area so as to allow freedom to its occupants while standing around after their baths—of course, a separate drying room is more desirable, but not necessary. Natural light and ventilation must be had and in abundance, and no plan should be at all considered that will not make ample provision for it. Avoid windows at the back of the showers as they are sources of cold drafts, and consequently dangerous.

For the business men there should be provided special bath accommodations adjoining their locker room. Their room should be more commodious than the other bath rooms, as only a percentage of the older men will use the swimming pool and the others will leisurely take their shower bath and subsequent rub-down. A hot room about 6 feet square is sometimes provided to advantage in the business men's shower room. Its desirability is dependent entirely upon local environment. If it is installed, its walls should be of clear glass to eliminate the possibility of undetected accident.

The bathers must have access to toilet accommodations other than that provided for the general membership. Inasmuch as the toilet room will be used before and after disrobing, it should not be necessary to pass through the shower room to reach it, as otherwise the members would carry dirt across the wet floor, which matter will ultimately find its way into the swimming pool. It is further objectionable to compel the members to pass through the shower room and chance the wetting of their clothing.

Natatoriums. In determining upon the disposition of the natatorium, the major consideration should be natural light and ventilation, with the sources so distributed that the sunshine will be directly admitted during the longest

part of the day. It should be borne in mind that the need of privacy may nullify the value of some windows as means of ventilation. A skylight over the swimming pool is of indubitable value, and if necessary, the plan should be warped to make this provision possible. Constructional means should be incorporated to guard against excess chilling of warmed air.

The pool should be either 18 feet or 21 feet in width and its length a factor of yards, and usually 45 feet or 60 feet. A pool 21 feet in width by 60 feet in length is considered standard and records made therein are recognized by athletic bodies as being official. The depths vary as indicated in Fig. VI, with a level section at the shallow end for the non-swimmers and with the deepest point in advance of the spring board.

The difference in initial cost between the standard pool and one of lesser dimension is not proportionately large, and other factors should be considered in concluding as to its size — the cost of water, cost of refiltration, and cost of heating and reheating. In a residential community, where the membership would be composed of high school students and others deeply interested in aquatics, the standard pool would certainly be a necessity, and its increased cost of maintenance can be defrayed by the income derived from paid attendances at exhibition games.

A spectators' gallery or bleacher should invariably be provided. It will assist in stimulating greater interest in water sports and ultimately in increasing membership.

Its position, whether at the end or along the side of the pool, should be elevated so that the spectators can readily see the water line. It is far better placed at the end or ends of the natatorium rather than at the sides where it becomes uncomfortable to keep turning one's head in following the swimmers.

In any event there should not be any walking space between the pool and the spectators' gallery in which the bathers can stand and obstruct the view of the spectators. The pool should be in no case free standing, that is, at least one side should be close to a wall so as to prevent the bathers from running around the pool and causing injury to one another.

In the construction of the ceiling over the pool care should be exercised that no ceiling beams or girders project down so as to prohibit the use of a spring board. The ladders into the pool should be recessed so that no part will

obstruct the clear swimming space and on which no member can cause himself injury. The ladders should be on the sides rather than at the ends, which, must be flush and without any projections or depressions, so that the swimmers can use the walls in negotiating turns in races. An unevenness would give an advantage to one man over the others. The rim of the pool should be provided with a sanitary gutter on sides and ends. The construction of this rim and other parts of the natatorium, together with a discussion as to the construction and choice of materials from a utilitarian standpoint, will be discussed in the following and concluding article of this series.

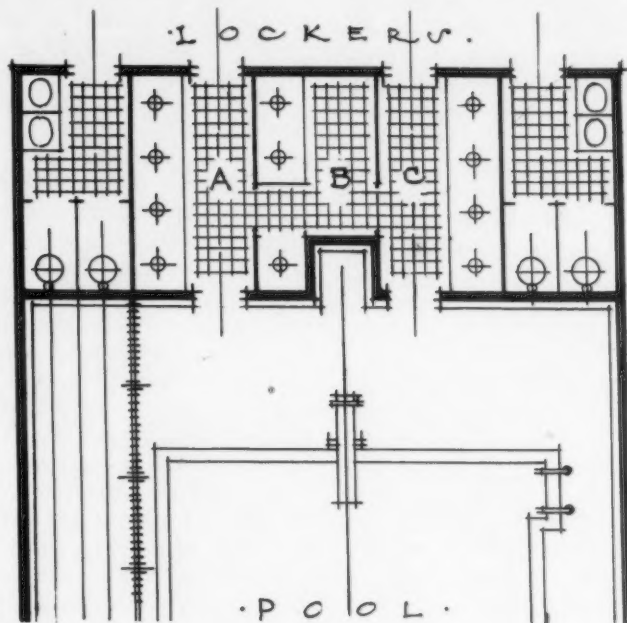


FIG. V.

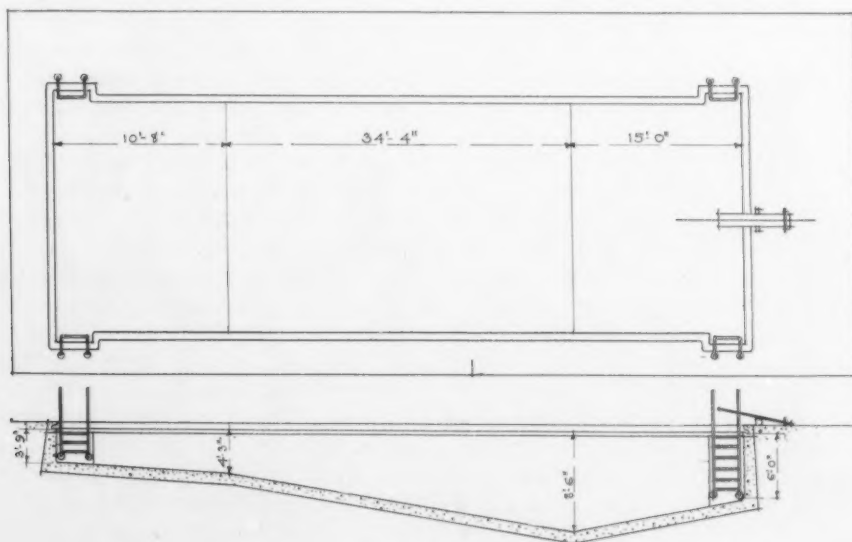


FIG. VI.

Architectural Jurisprudence.—Part II.

AN ARCHITECT'S COMPENSATION AND LIABILITIES.

BY WILLIAM L. BOWMAN, C.E., LL.B., OF THE NEW YORK BAR.

SINCE a proper understanding of the duties of an architect is essential as a basis for the full appreciation of his liabilities, the readers are referred to articles on "Legal Hints for Architects," published in *THE BRICKBUILDER*, issues of July to November, 1911. In our present consideration we will discuss the architect's liabilities under the following headings: (1) Liability to the State or Municipality, (2) Liability to the Employer, and (3) Liability to the Contractor and Other Persons. It is of course understood that we shall treat only of the liabilities which an architect incurs professionally. This will, however, include those cases where he loses his remuneration for services performed.

LIABILITY TO THE STATE OR MUNICIPALITY

The States of Illinois, California, and New Jersey have passed statutes which restrict the practice of architecture to those who comply with the requirements set forth. New York is about to pass such a law. Many attacks have been made upon these statutes as being contrary to the Fourteenth Amendment of the Constitution of the United States, but to date they have been unsuccessful and it seems now well settled that the State has the right to make and enforce such restrictive laws regulating the professions. Failure to comply with these statutes may involve the architect in the following difficulties: Firstly, he is powerless to recover compensation for work done or services rendered. In one case, in order to help the architect as much as possible, the Court decided that the architect might take a contract for architectural services before he had complied with the statute requirements, and that the law was satisfied if he had followed its regulations before starting work. This distinction does not seem sound and should not be relied upon. Secondly, non-compliance with such statutes is a misdemeanor which is a criminal offense. The punishment for this offense is sometimes mentioned in the statute or may be set forth in the criminal code and ordinarily carries an arrest with fine or imprisonment for a short period or both.

Then, in addition to the state statutes, many of the municipalities such as cities, counties, towns, and villages have local regulations requiring an architect to take out a license to do business or to pay a tax on his profession. Failure of the architect to attend to these ordinances usually permits the authorities to compel him to pay not only the stated license fee or tax with a high rate of interest, but also a fine for non-payment. Should the proposed National Income Tax Law become effective, architects earning large professional incomes will have to observe its requirements and pay their proper tax thereunder or be liable for the stated punishment.

As these practices and taxing statutes are becoming popular not only as a protection to the profession but also as a source of revenue, it behooves all architects to make frequent inquiries regarding such laws from responsible and competent parties and thus avoid the embarrassment and financial losses which are sure to result from failure so to do.

LIABILITY TO THE EMPLOYER.

The duties of an architect towards his employer, whom we will call the owner, may be summed up in the following items:

1. Reasonable skill, ability, and taste in planning, designing, and superintending construction work in the light of present knowledge.

2. Reasonable and honest judgment in such planning, designing, and superintending, and in advising the owner in regard to anything connected therewith.

3. Employment of competent and careful assistants.

A lack of ability or failure to comply with these duties renders an architect liable to the owner therefor. The damages or loss to the architect may be either the loss of his remuneration, should the owner choose to relieve the architect from his contract of service, or the damages actually suffered by the owner on account of the architect's failures or negligence, in which case the owner claims and stands upon the breach of the contract of service by the architect. In this latter case the architect is entitled to his compensation or credit for it should the damages prove to be more than such compensation. Since the ordinary case of trouble culminates in an action by the architect against the owner for his compensation or the balance of it, many are unaware of any damages other than the loss of such compensation when the owner is successful in his defenses of unskilfulness, non-performance, negligent superintendence, etc. Among the reported cases of such actions the following defenses were held good and the architect refused the compensation he sued for:

1. Where the contractor's estimates were substantially in excess of the limit of authorized cost.

2. Where the actual cost greatly exceeded the limit of authorized cost.

3. In public contracts where either the contractor's estimates or the actual cost exceeded the appropriation for the construction including the architect's fees.

4. In public construction work, where there was no appropriation or where the contracting officials had no power to contract; or where the charter requirements were not fully complied with; or where the appropriation was void because of failure to comply with charter requirements, etc.; or where the architect was not qualified or was disqualified to accept such public contract.

5. Where the plans and specifications are not delivered within a specified time and also are not complete according to contract or custom.

6. Where the plans had no dimensions or figures on them and the scales did not correspond, and the plans and specifications were full of omissions and inaccuracies.

7. Where the plans and specifications or the buildings constructed therefrom did not fulfill the purpose for which they were designed or were defective in other than minor details.

8. Where there is wilful omission or departure by the architect from the terms of his employment or from the directions and instructions of the owner, or from the approved plans and specifications.

9. Where the plans and specifications or either were prepared in violation of the law, either state statutes, or city ordinances, or building codes, etc.

10. Where the superintendence is negligent, the defects being such as were discoverable by the exercise of reasonable care and skill on the architect's part.

There are suggestions in the opinions deciding these cases that, if the action brought is to recover a balance due the architect, the owner could, under these circumstances, ask and secure the return to him of payments already made to the architect. In many of these cases the question as to whether the owner waived or excused the architect's proper performance is raised, but it is usually not given much consideration by the ordinary jury.

Let us now consider some of the cases where the owner, instead of being satisfied with preventing the architect from getting any compensation for his work, demands his damages for unskilful service or negligence. The measure of damages appears to vary somewhat, but seems generally to come down to a recoupment by the owner of his loss from the architect.

In one case where the chimney flues were not large enough for the purposes for which they were designed, the owner was permitted to retain from the architect's compensation an amount equal to the cost of correcting this defect not discovered until after construction. In another case the general plans showed a different roof projection and construction on the front elevation than on the other three elevations. There was but one detail drawing and that corresponded with the two side and back elevations. The owner wanted the building as shown on the front elevation, but the builder, under orders from the architect, constructed in accordance with the single detail drawing. The architect later had to sue to try and recover the balance due him for his services and the owner defended on the ground of non-performance and claimed \$500 because the architect had caused material departures from the plans without any authority and against his protest. The architect claimed that the front elevation was structurally and architecturally imperfect and that he had the right and the duty to correct it. The evidence showed that the building could easily be changed to suit the front elevation at an expense of \$400. The decision held that the principal drawings formed the basis of the contract and also formed the test of what was required for the performance; that since there was a substantial performance on the part of the architect, and there being no bad faith on his part, he could recover his full fee less the cost to the owner to change the house as shown by the front elevation. Thus the owner was allowed \$400 for the work to be done. This case and others indicate that generally speaking the architect is governed by the same rule of damages as contractors. This rule may be stated, "The party damaged is entitled to recover a sum which would leave him as well off as he would have been had the other party fully performed the contract." In further explanation of this rule of damages another case is interesting. The architects were only employed to superintend and supervise certain alterations and repairs. The architects and their inspector or clerk of the work allowed floor timbering to be insecurely and carelessly laid and also contrary to the building code. The work was completed and the architects and builders fully paid. For several years the work

caused trouble with the plastering and decorations which were repaired, but finally the floor settled so badly that it had to be taken out and extensive repairs made. The owners then sued the architects for their negligent supervision, and upon the jury finding that they had not exercised reasonable care and diligence in supervising the work, although one of the architects testified that either he or his partner was there daily, the owner was permitted to recover a sum which would leave him as well off as he would have been had the architect properly supervised the original repair work.

In a late case the architect was held liable for the damages caused by dry rot in flooring improperly laid in concrete, notwithstanding his excuse that it was the result of the incompetency of the clerk of works appointed by the owner. In another case it was suggested that if the architect should negligently or unskilfully overestimate the amount of progress certificates and the employer should have to complete the work at his own expense, the builder becoming bankrupt, that any loss from the fact of the overpayment to the builder could be charged against the architect. Probably the most serious decision respecting an architect's liability holds that if the architect guarantees or warrants that a building will only cost a fixed sum, the owner can recover any excess cost above that amount from the architect. The same case also decided that if an architect locates a building so that it violates restrictions against the property imposed by a municipality, the owner being without knowledge of the same, that the architect is responsible for all damages accruing thereby, including attorney's fees in defending such violations.

When we consider defective or improper building construction there are two people, the architect and the contractor, who may have caused the injury although they may not have acted in concert, and in such cases they are each liable for the damage. Should the owner choose to hold the architect liable, he may do so and recover his damages from him. Strange as it may seem, the architect then does not have any recourse against the builder even though the latter was partially or equally or primarily responsible for such condition of the work. On the other hand, if the owner collects from the builder he loses his right of action against the architect and for this reason many architects have escaped in such cases. That is also the reason why many architects are not aware of their liability under such circumstances.

Whether the architect in his work is considered as an independent contractor or as an agent or servant of the owner, his employer, may make some difference in his responsibility to his employer. For example, if the architect is the agent of the owner and during the superintendence he refuses to let the contractor control the work and takes charge and control in matters of method, procedure, and detail, he may make the owner responsible for the negligence of the contractor and his employees. Should the owner then be compelled to pay the damages for such negligence, it would seem that he could reimburse himself from the architect. The owner has recourse also against the contractor, and he usually takes that means since it is easier and cheaper. We have a general rule of law applicable here, that an employee is directly liable to his employer for any damage occasioned by his negligence or

misconduct in connection with his work, whether such damage is direct to the property of the employer or arises from compensation the employer has been compelled to make to third persons for injuries sustained by them.

In the matter of inspection and superintendence there are cases holding that unless improper materials or poor workmanship are seasonably and reasonably objected to, rejected, and condemned, that after incorporation and partial payment therefor, it is then too late for the owner or architect to object to such materials and workmanship, and the owner will be considered to have waived his rights under the contract in that regard on account of the architect's failure to perform his duty. As the owner then has no recourse against the builder he should be able to recover his loss from the architect who is responsible for such a condition.

There are times when the architect takes compensation from the contractor on a job for various reasons, some proper and others improper. Under the usual rule of the law of agency, the agent must account to his employer for any secret profit or compensation he has taken for doing what he was under contract with his employer to do, or the amount paid him for doing something which would presumably be against his employer's interests. This does not apply where the employer knows of or approves of such outside employment, hence it is a safe rule for an architect to advise the owner when he desires to do anything for the contractor for which he intends to demand or receive pay.

A somewhat analogous but more serious situation arises when the architect requests or receives a gift, gratuity, commission, discount or bonus from a contractor, material man, or employer of labor for giving them the work or with an understanding that he shall act in a particular manner in the business entrusted by the owner to him. In many states this is a crime. For example, in New York it is called a misdemeanor and carries a punishment of not to exceed \$500 fine or not more than one year imprisonment, or both. A word to the wise is sufficient.

LIABILITY TO THE CONTRACTOR AND OTHER PERSONS.

Under this topic we will discuss very briefly the architect's liability to the contractor and to persons injured either physically or financially by reason of his lack of skill or failure to properly perform his duties. An architect's duty to a contractor consists chiefly in giving honest and fair estimates of work done or certificates for payment at the proper time; reasonable, honest, and timely decisions on all matters within his scope, either as agent of the owner or as an arbitrator; and written orders for alterations, additions, extras, or omissions only when he is authorized by the owner to give such orders. A failure on the part of an architect to perform these duties, except perhaps his failure as an arbitrator, creates a liability to the contractor.

For a general statement it may be said that for a non-feasance, which is the neglect of an architect to do some act which he was bound to do under his employment, the architect is not responsible to others than his employer. When, however, the architect does a lawful act or his duty in an unlawful or improper manner, he is always responsible to the employer and often to the injured party. While there are not many reported cases directly in point, yet those few are important. In one of the rather old cases an architect employed by a church ordered some stone from a material man on account of and for the Church

Building Committee. Later the church refused to pay for the stone and was sued by the material man. Up to the time of the trial the architect contended that he had authority to order for the church, but on cross-examination he admitted receiving a letter from the Church Committee expressly stating that no stone must be ordered in the name of the church. This lost the case for the material man, who then sued the architect not only for the value of the stone, but for his costs and lawyer's fees in the defeated action. In defense, the architect offered to pay for the stone alone. The jury were told that if they believed the architect represented that he had authority to order the stone from the church authorities and that that representation was untrue, then the material man was entitled to recover all he asked. Their verdict was against the architect. This was a pretty severe lesson for him, since he had to pay about \$325, costs of the action lost to the church, about \$500, the fees of the attorneys in that case, and about \$150, the cost of the stone itself, besides the costs taxed against him personally.

In a very late case where the contractor refused to go ahead with the work and the architect said that he would see that he was paid for the work requested, the opinion of a well-known judge intimated that where an architect knowingly and wrongfully made changes and ordered materials and work that were not embraced in the contract between the owner and the contractor, the architect was responsible therefor.

Probably the leading case discussing an architect's liability for causing physical injury or death discloses the following facts. A central column of a large building was planned to be placed on a cut stone block with 18 inches of concrete thereunder and upon undisturbed earth. In the construction work, unknown to the architect, this column was placed over an old cistern, the earth around which was disturbed and only 12 inches of concrete were placed. Later the column collapsed, killing several people. In an action against the owner he was not held responsible. The opinion holds that in the exercise of the superintendence the architect was an independent contractor, and hence he and the contractor were each responsible for the damages caused by this disaster. The decision also stated that if the trouble had been a result of following improper plans and specifications, the architect would have been responsible for all damages suffered therefrom.

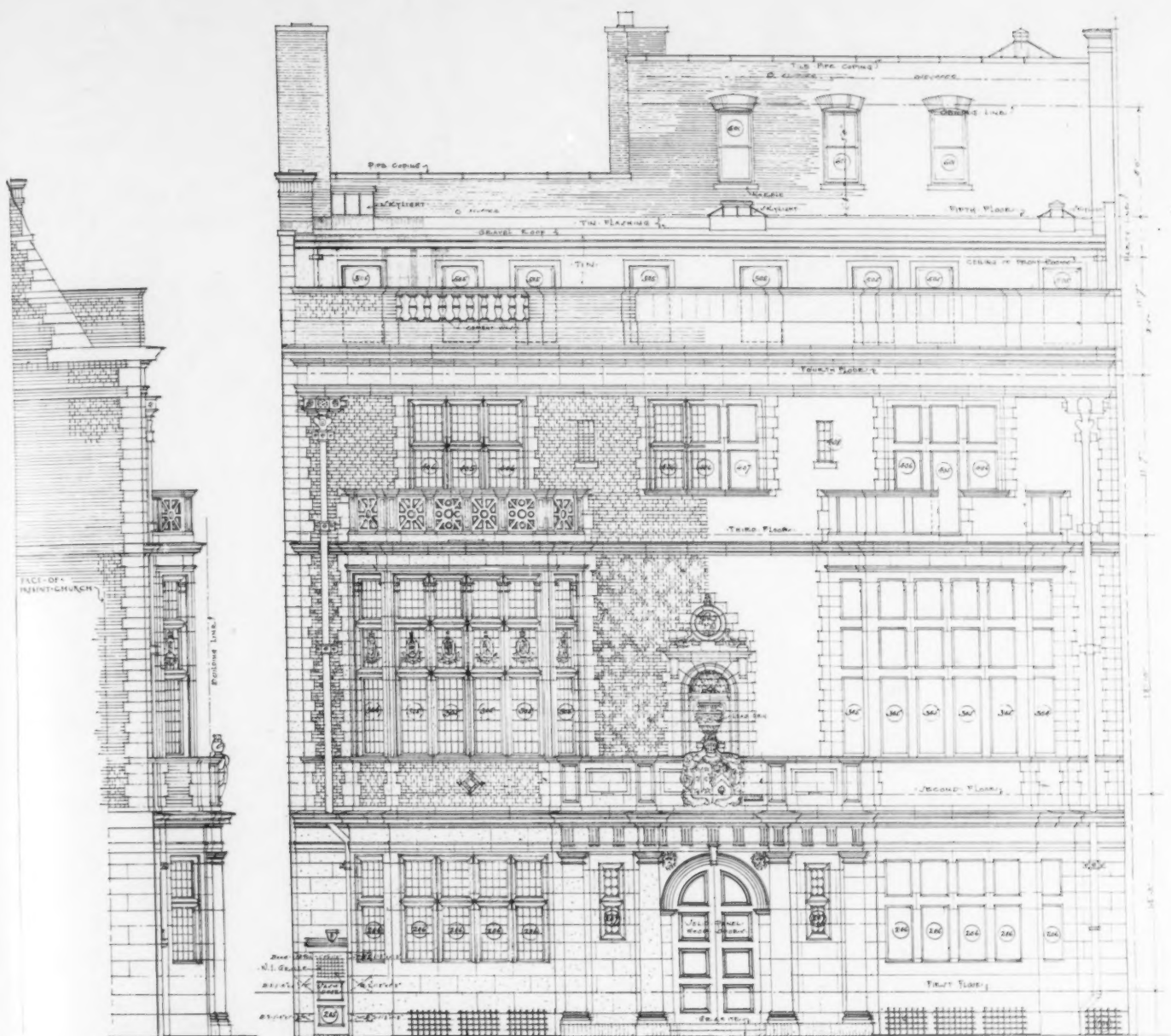
In another death case the opinion of the court shows that they would hold the architect responsible for any negligence in failing to exercise the ordinary skill of his profession which results in the erection of an unsafe structure whereby any one lawfully on the premises is injured. They also were of the opinion that an architect who knowingly permitted a departure from the plans and specifications, or failed to condemn any improper work which he discovered, would be responsible to any party injured thereby.

These cases and the opinions expressed in them are serious. It is hoped that architects will give more time and attention to personal supervision, or by the employment of able assistants to whom they entrust their supervision. The fact that architects have been lucky in the past in these matters has lulled many into the idea that they have no such financial liability as herein set forth, and it is feared that some are going to have a rude awakening unless they take heed and appreciate this warning.



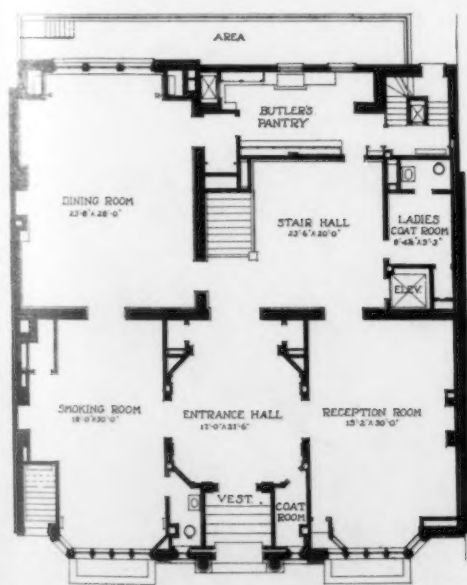
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JOHN RUSSELL POPE, ARCHITECT

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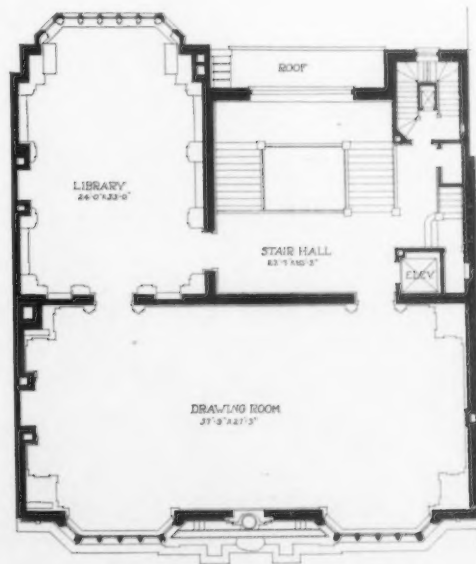


FRONT ELEVATION

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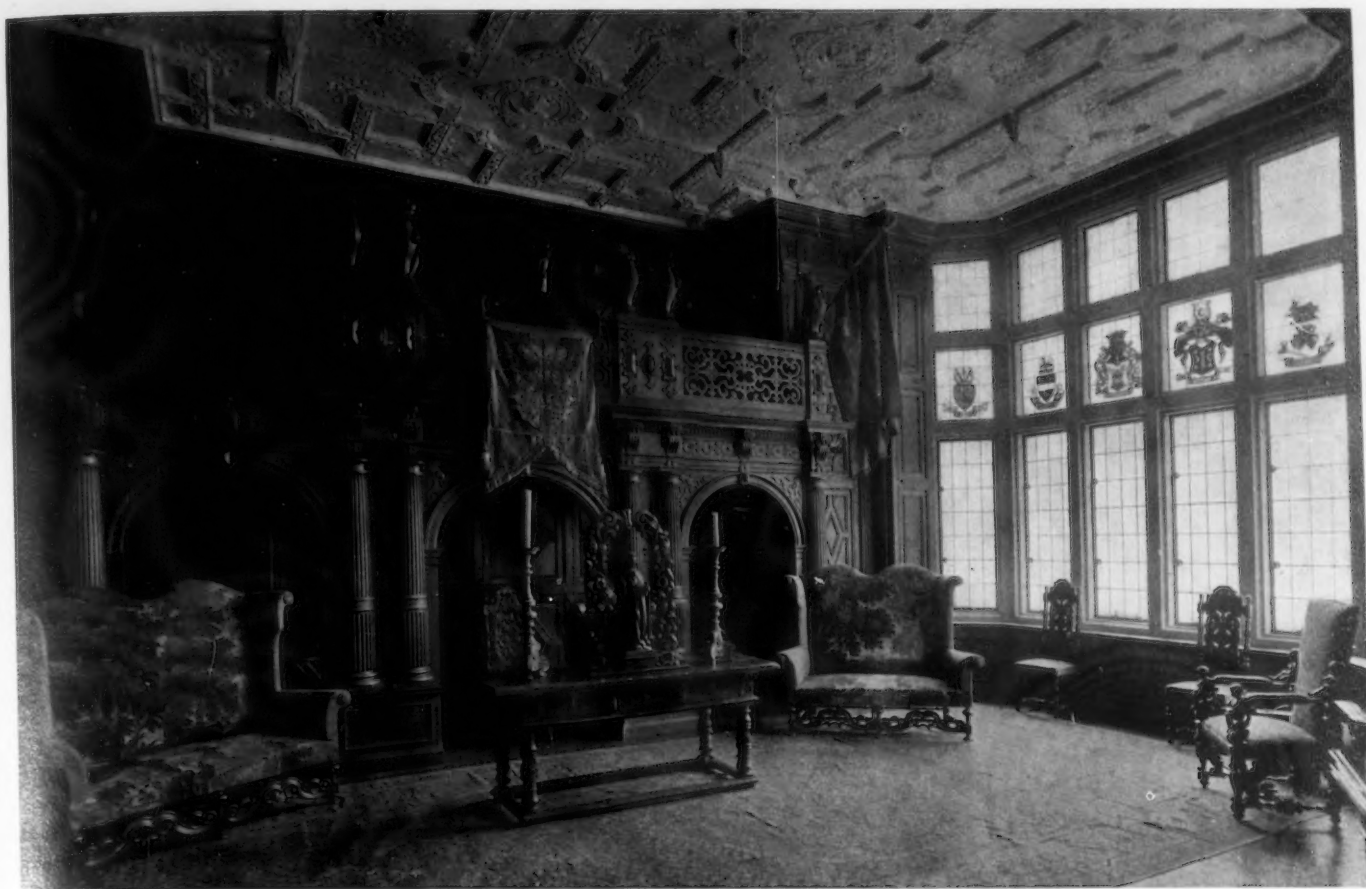


SECOND FLOOR PLAN

JOHN RUSSELL POPE,
ARCHITECT

U.S.N.

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DRAWING ROOM



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JOHN RUSSELL POPE, ARCHITECT

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LIBRARY



DRAWING ROOM



BEDROOM



DINING ROOM

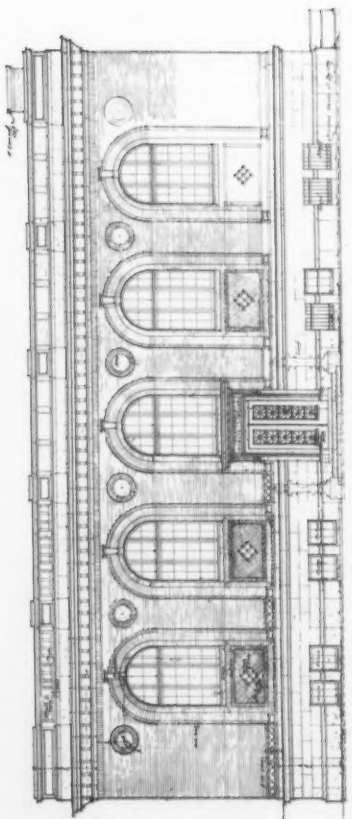
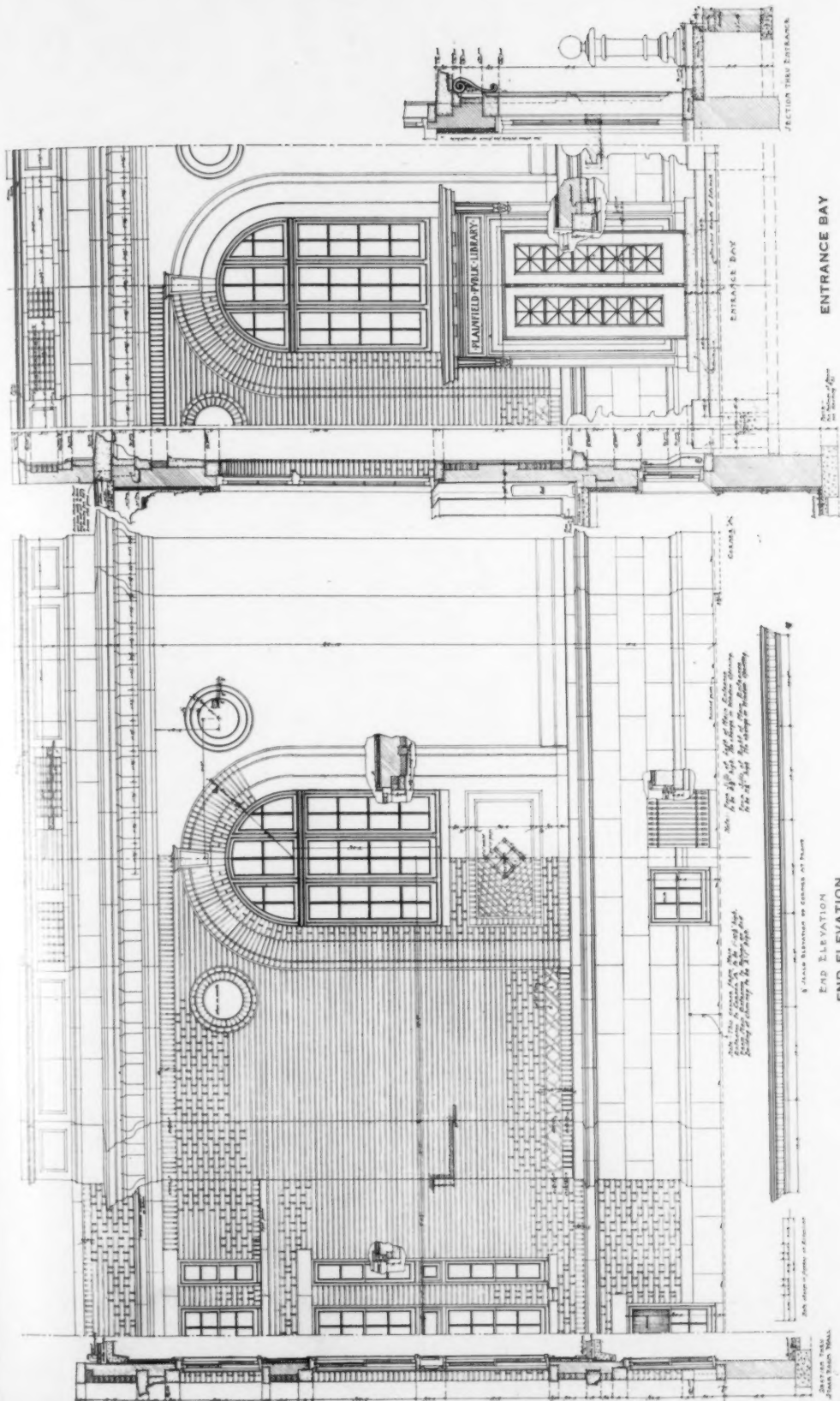
HOUSE, PARK AVENUE, NEW YORK CITY
JOHN RUSSELL POPE, ARCHITECT

1888

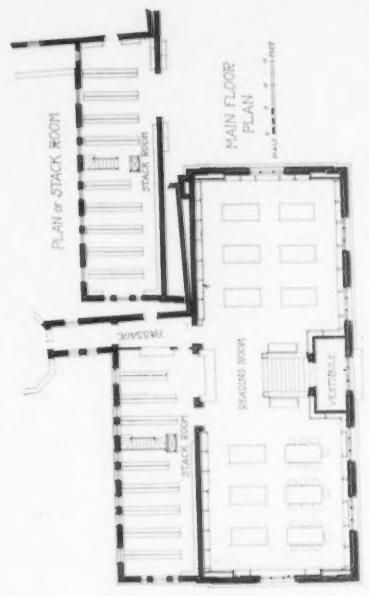


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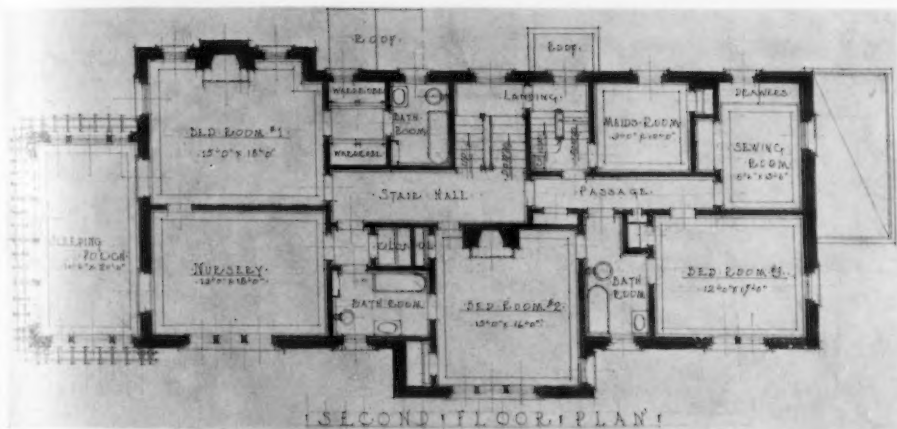






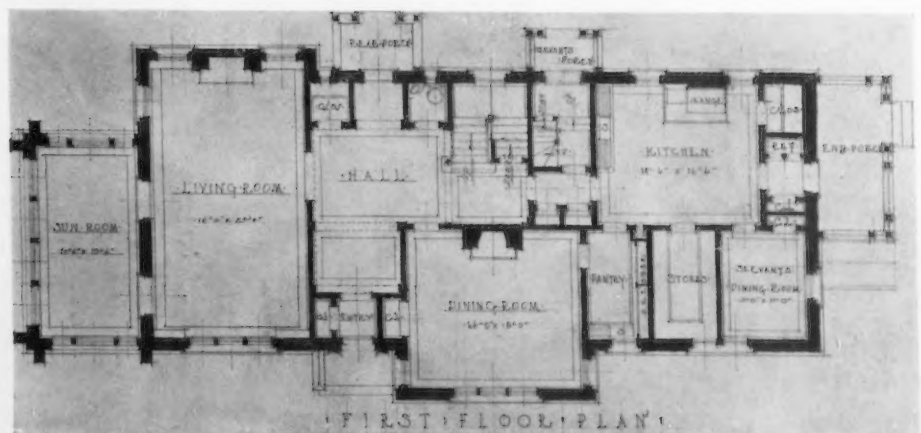
HOUSE AT SHORT HILLS, N. J.
ALFRED BUSSELLE, ARCHITECT

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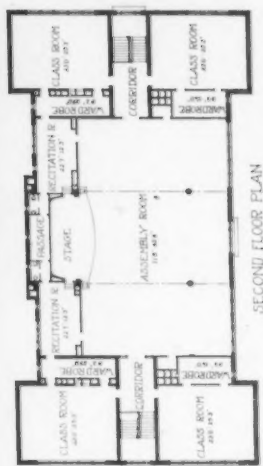
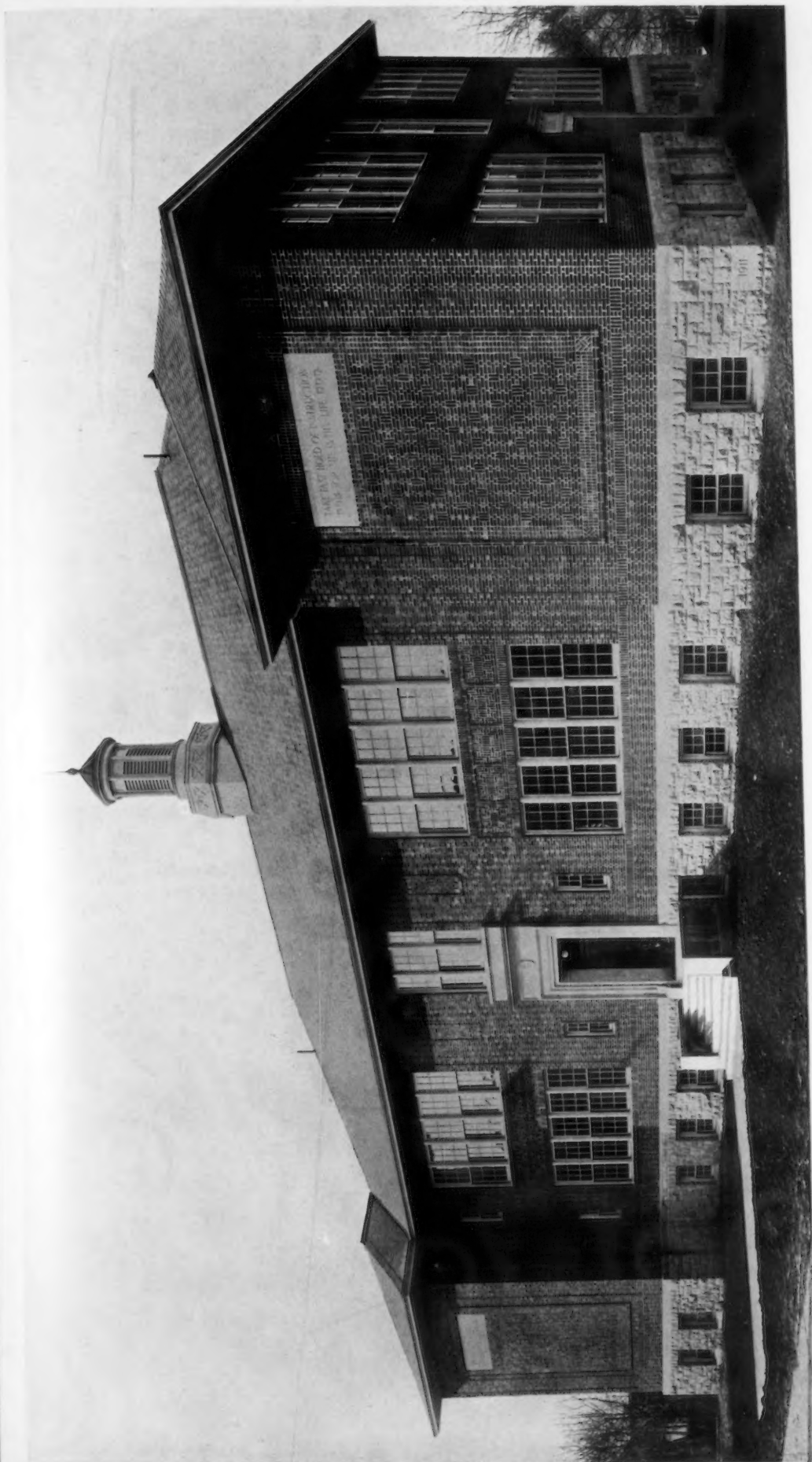
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ALFRED BUSSELLE,
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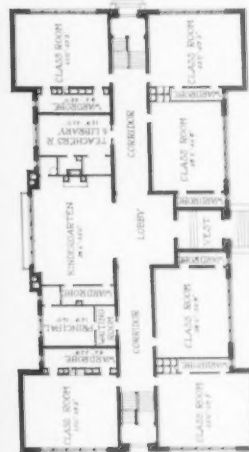
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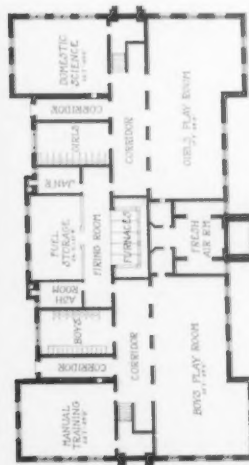
SECOND FLOOR PLAN

WM. W. RASMUSSEN
AND
ERNEST SIBLEY
ASSOCIATED
ARCHITECTS



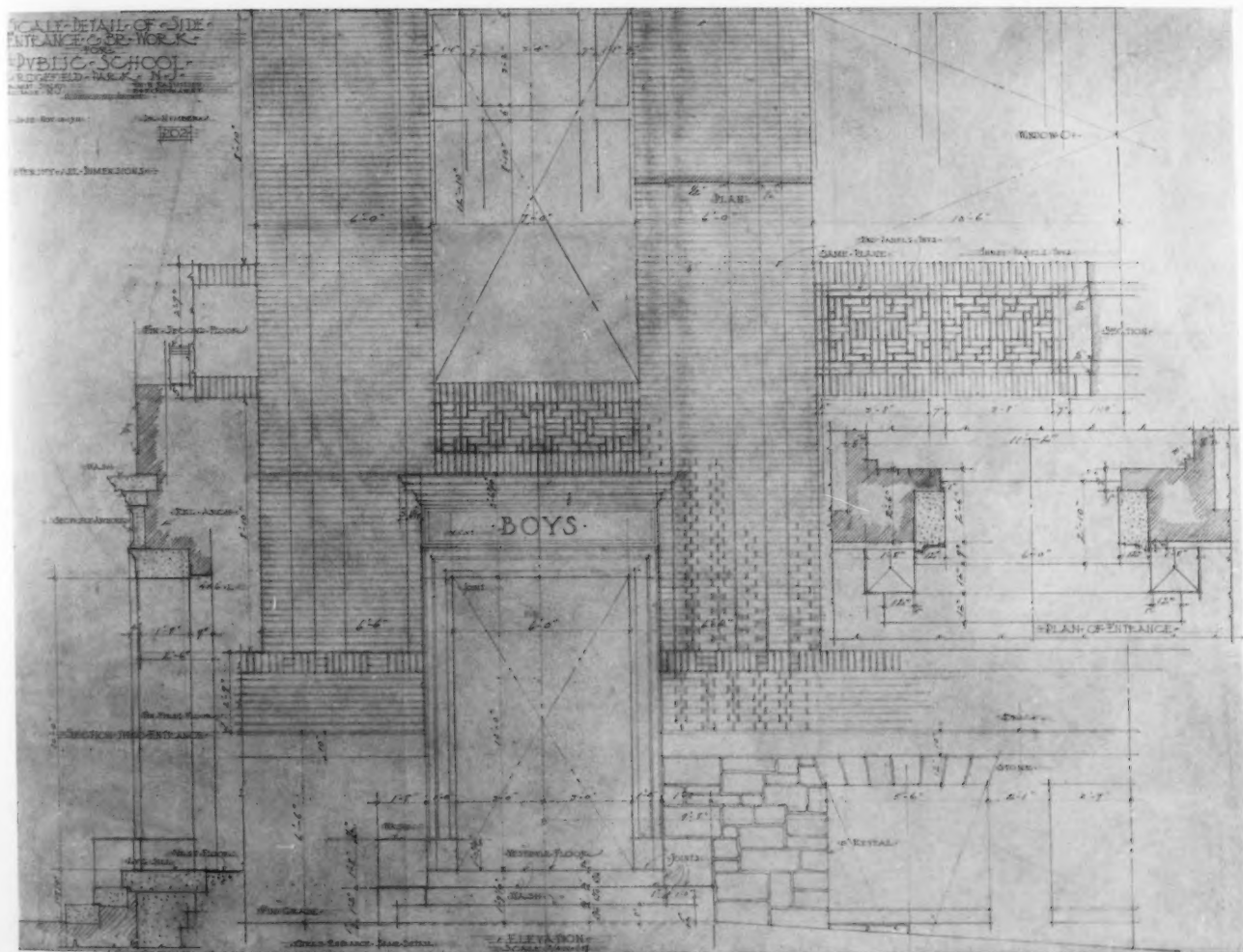
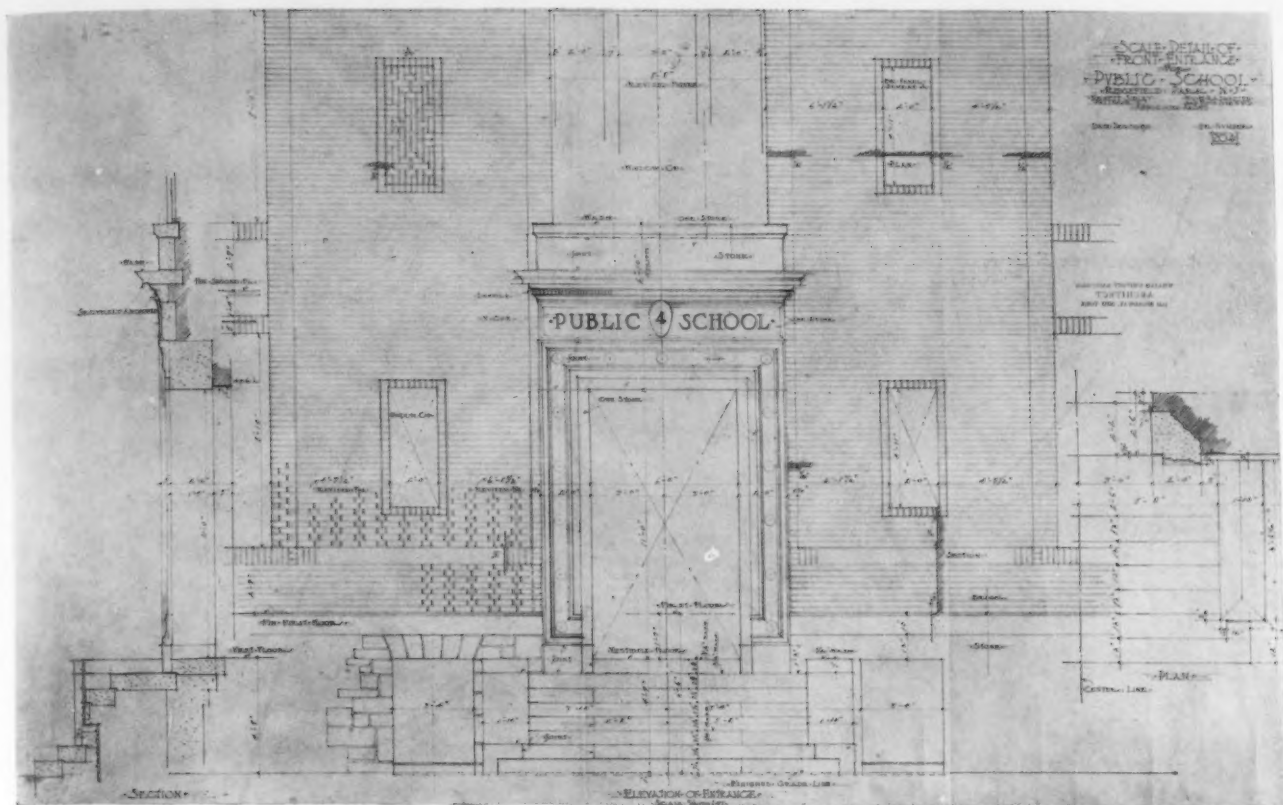
FIRST FLOOR PLAN

SCHOOL,
RIDGEFIELD PARK,
NEW JERSEY



BASEMENT PLAN





SCHOOL, RIDGEFIELD PARK, NEW JERSEY
WM. W. RASMUSSEN AND ERNEST SIBLEY, ASSOCIATED ARCHITECTS

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HOUSE AT ATLANTA, GEORGIA
EDWARD EMMETT DOUGHERTY, ARCHITECT

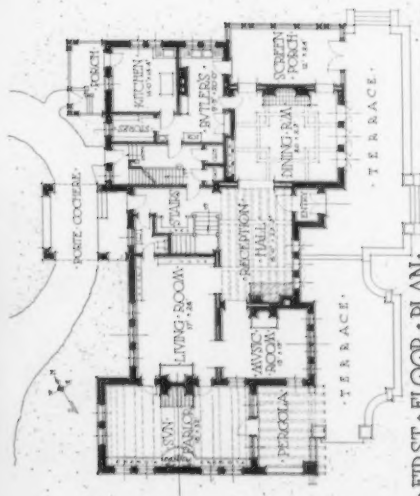
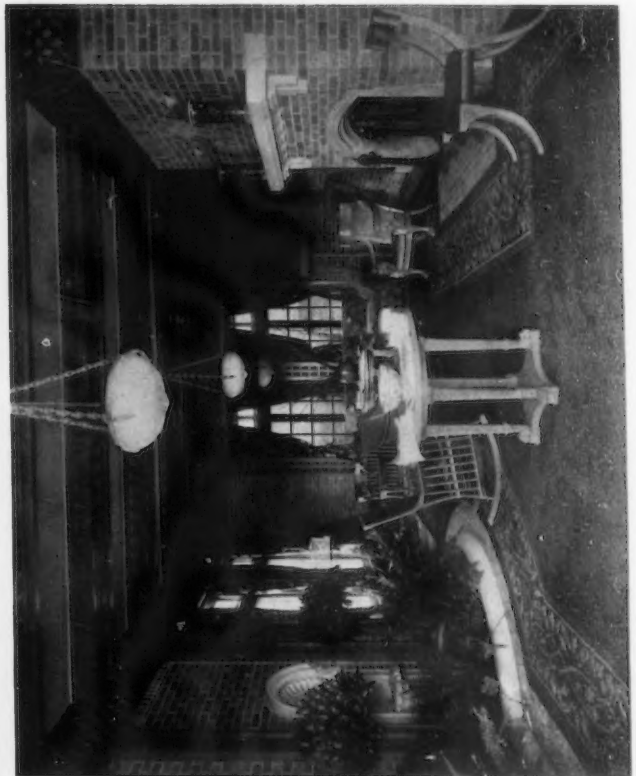
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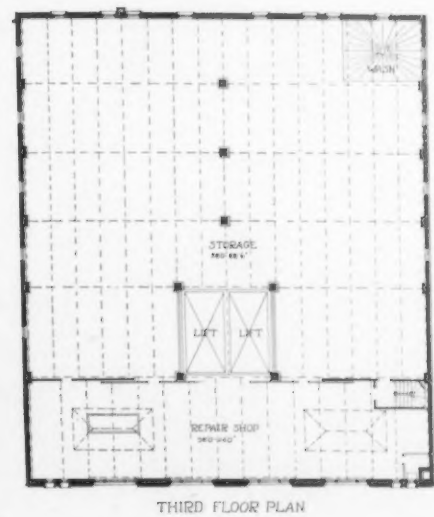
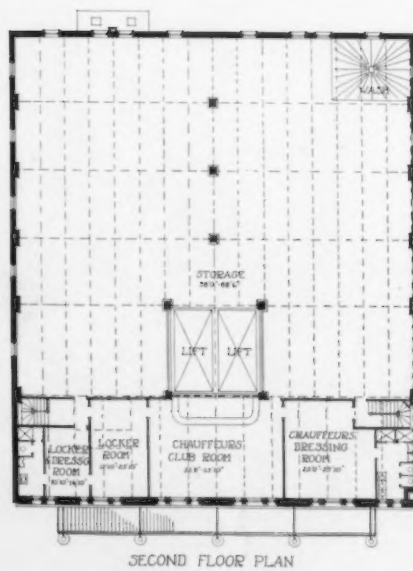
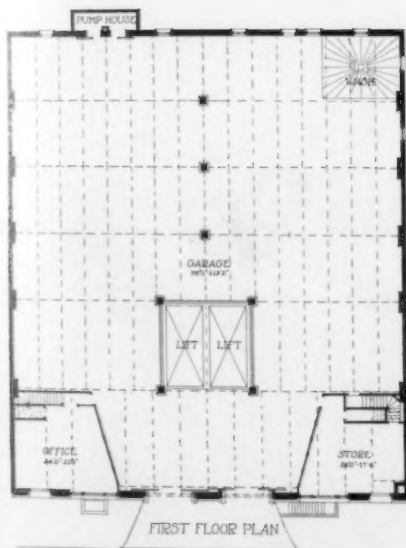
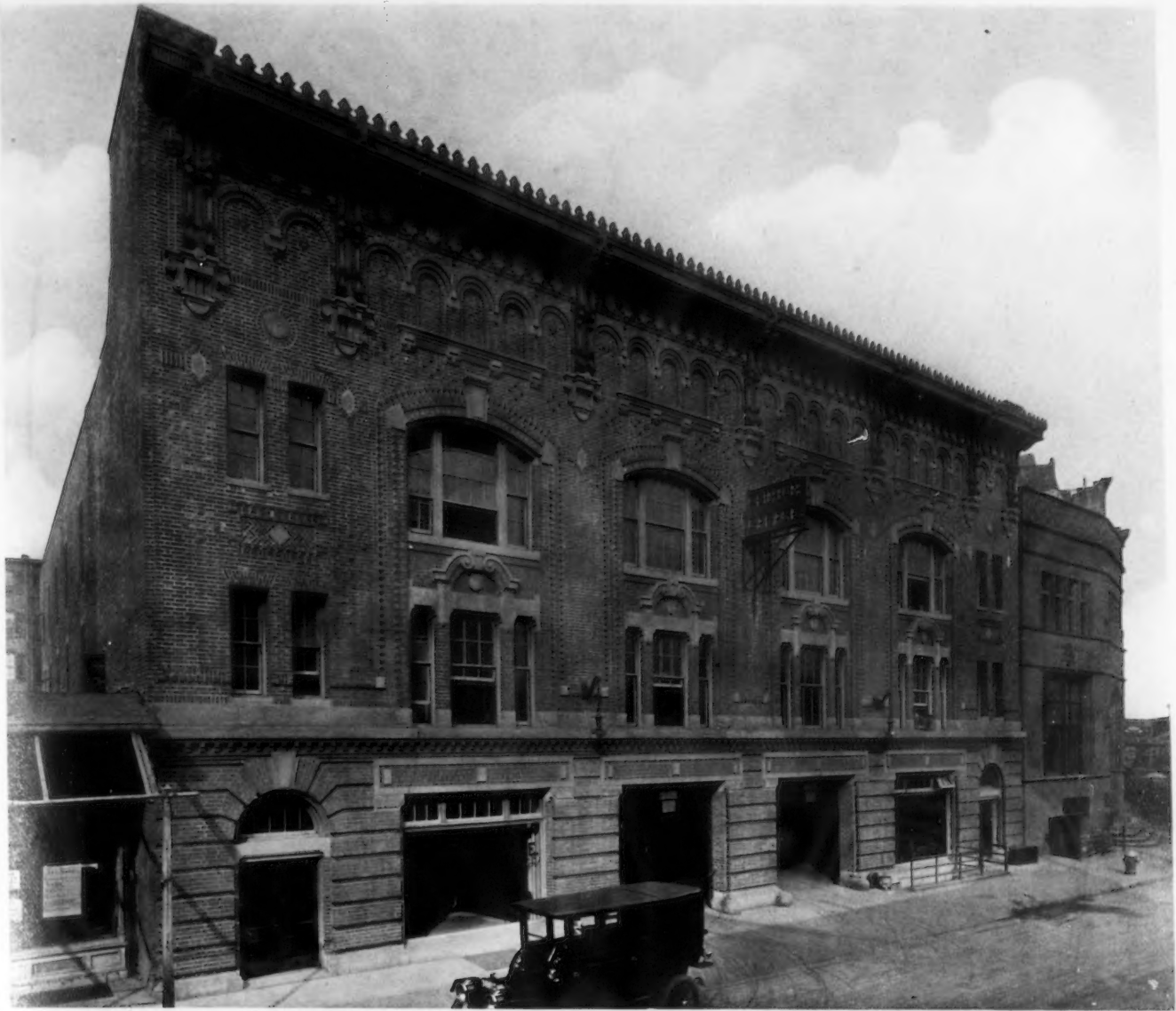
EDWARD EMMETT DOUGHERTY,
ARCHITECT



FIRST FLOOR PLAN.

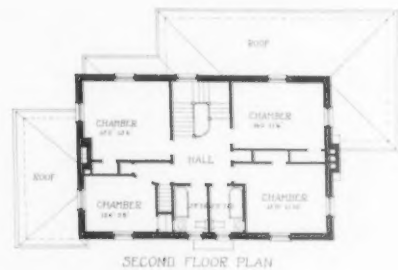
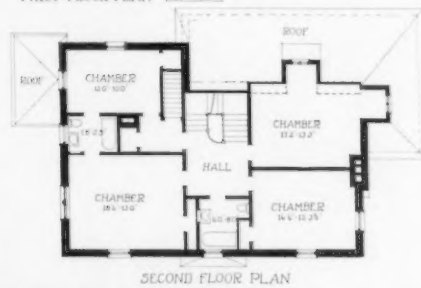
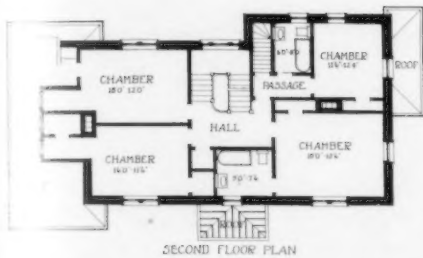
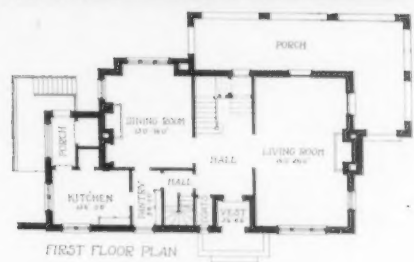
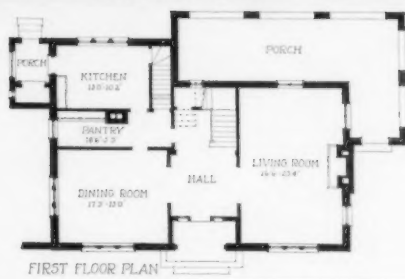
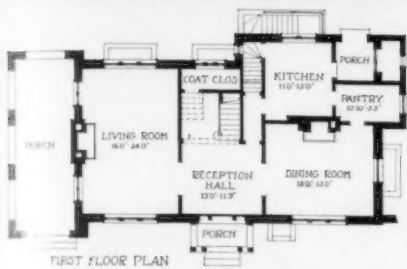
HOUSE AT
ATLANTA, GA.

100-101



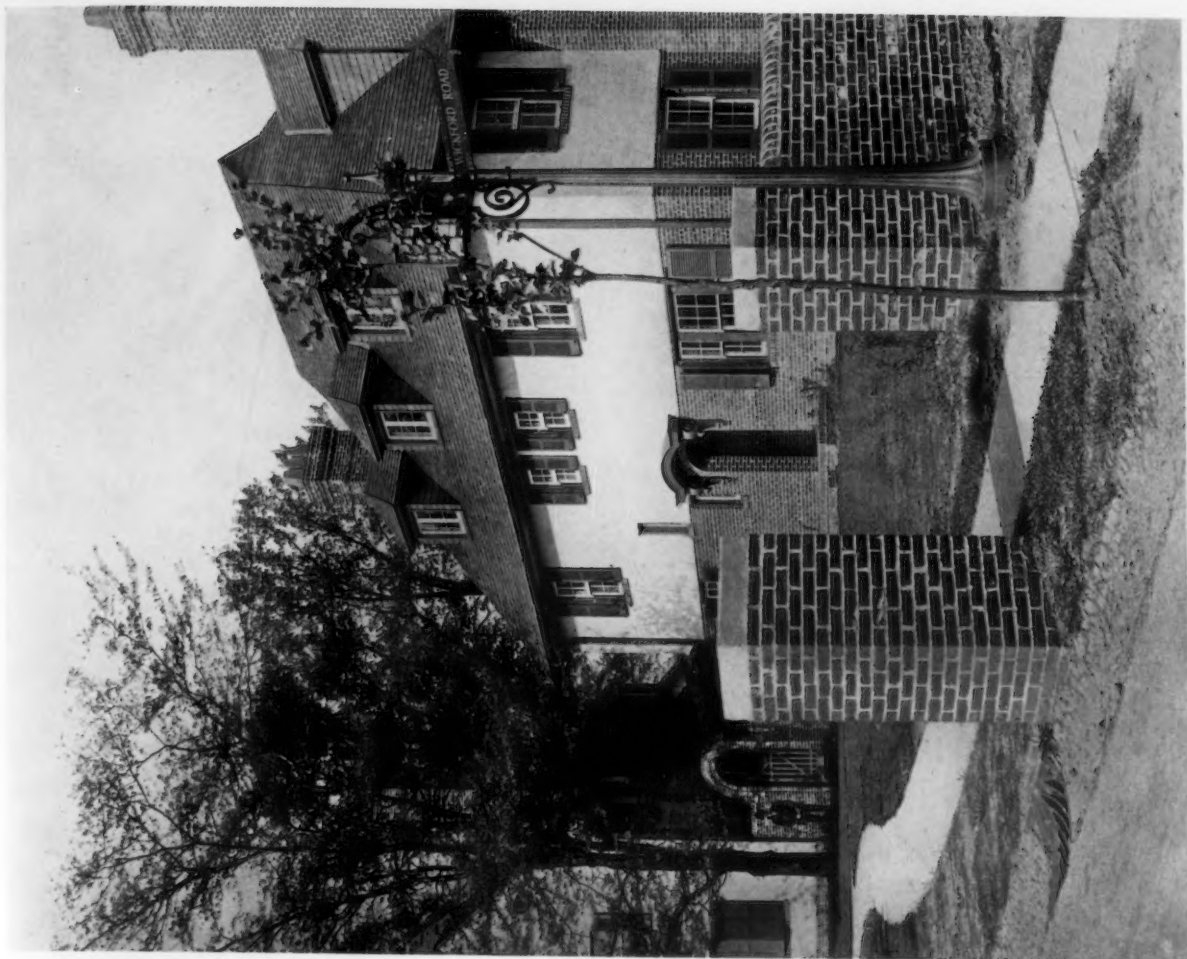
GARAGE AT BROOKLYN, N. Y.
WM. A. BORING, ARCHITECT

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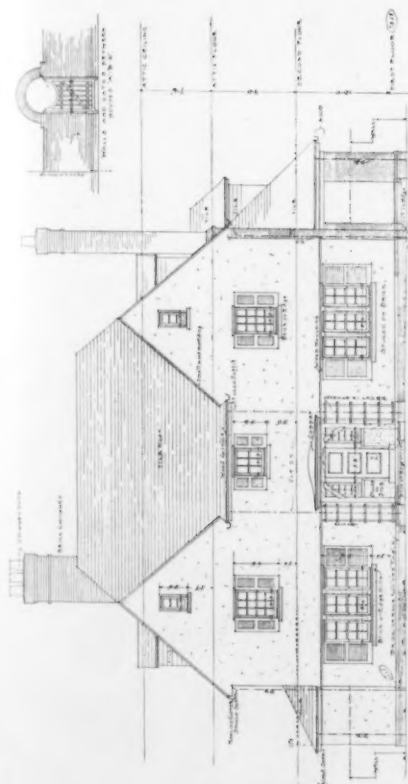


GROUP OF HOUSES, ROLAND PARK, MD.
EDWARD L. PALMER, JR., ARCHITECT

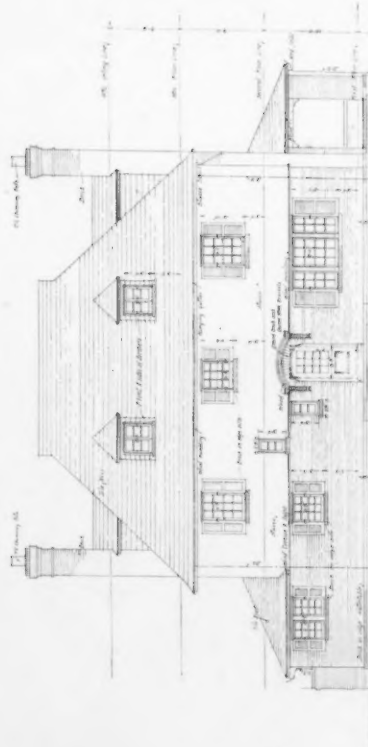
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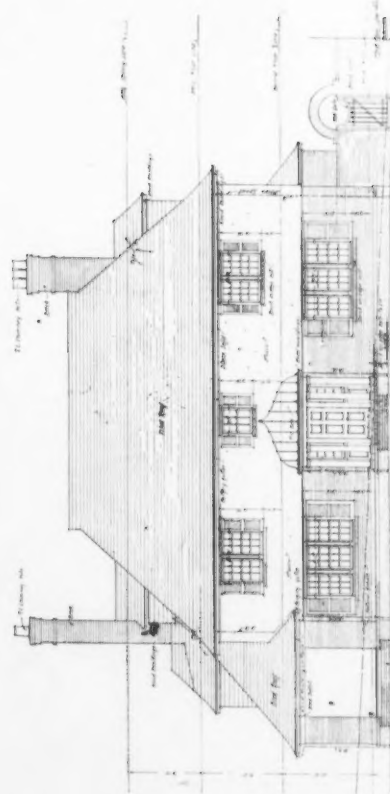
GROUP OF HOUSES, ROLAND PARK, MD.
EDWARD L. PALMER, JR., ARCHITECT



ELEVATION NO. 1

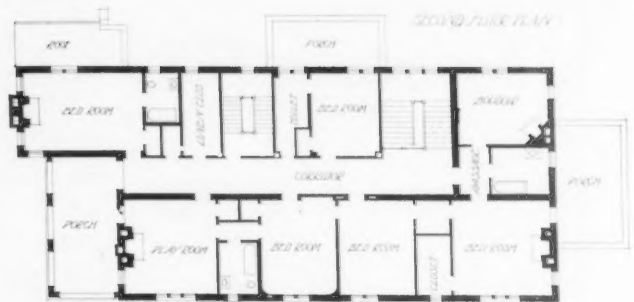
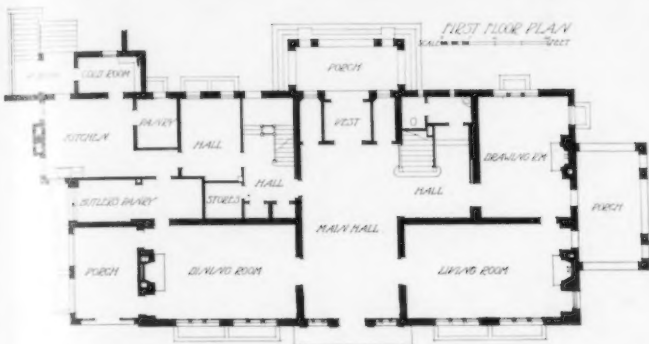


ELEVATION NO. 2



ELEVATION NO. 3

100-100



HOUSE AT KANSAS CITY, MISSOURI
WILDER & WIGHT, ARCHITECTS

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Brick Manor-Houses of France.—Part II.

THE CHATEAU OF LA MORINIÈRE.

BY SIDNEY FISKE KIMBALL.

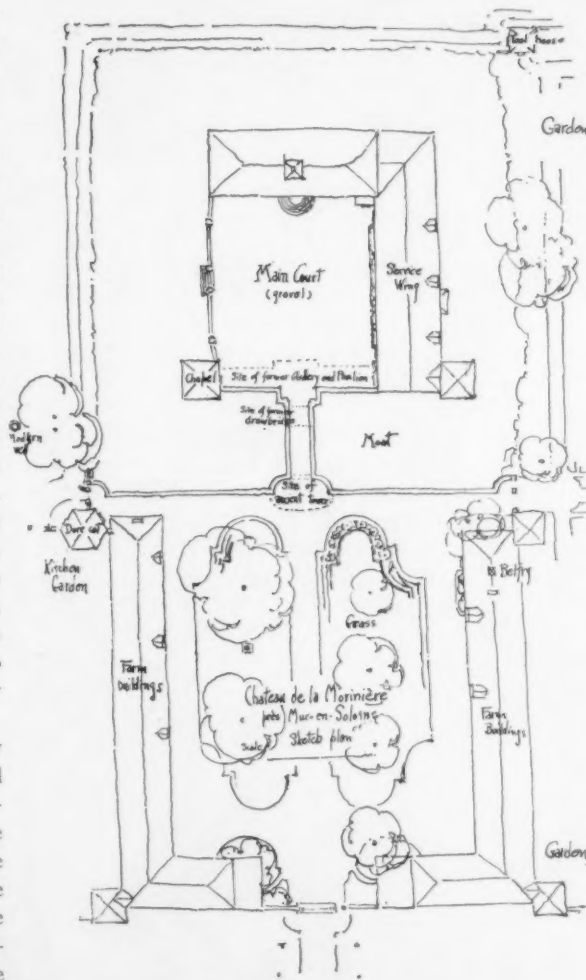
THE visitor to the Loire Valley who merely goes the well-established round of the historic châteaux is very likely to find himself disappointed. This is perhaps largely due to their vaunting by artists and writers to a point which it is almost impossible for the reality—pinchbeck or frigidly restored as it often is—to sustain, and partly perhaps to the feeling that their grandiose and florid style, in spite of its beauty, has little of direct suggestive value for any of our really vital problems of the present. There is hidden away in the region, however, a wealth of minor châteaux, off the traveled routes and unblazoned by literature or history, which, if he can but find them, cannot fail to turn an architect's impression into one of enthusiasm and delight. Baedeker, and even the châteaux guide of Joanne, ignore La Morinière, La Ravinière, Ferté-Imbault, and Herbault-en-Sologne; to locate them one must use the most detailed maps; to reach them, motors, *voitures particulières*, or cycles at least. Yet when one has found them, or others like them, one realizes, possibly for the first time, the existence and the charm of a little known genre of French country residence, not castle, palace, nor yet fortified grange exactly, but akin somewhat in nature and handling to the smaller manors which make so much of the interest and beauty of England.

Owing to the long insecurity of the Hundred Years War and the civil wars, and to the subsequent centralization of the nobility at the court, these are much less common in France than in England, but at the beginning of the sixteenth century and again to a less degree in the reign of Henry IV, there occurred moments favorable to their erection. Though not intended to sustain a siege, such houses were generally protected against casual marauders by a wall and a moat, which sometimes included the farm buildings as well. As the great castles likewise ceased to be fortified, the term "château" lost any implication of military strength and came to be applied indiscriminately to any country residence of some importance. At the same time brick, which in the Middle Ages had been generally abandoned in favor of stone, except in some prov-

inces in the south, once more became popular, apparently for esthetic reasons, since it is often used where stone was easily obtainable. It was now frequently employed with stone trim, a practice previously little known.

Among these unhackneyed minor châteaux few are more masterly in design or more lovely in present effect than La Morinière, situated about twenty miles distant from Blois, a mile from the high road to Ramorantin, and two or three from the occasional trains to the sleepy village of Mur-en-Sologne. Local tradition has it that it was con-

structed, like Chambord, as a hunting lodge by Francis I; but in size it certainly little resembles its great neighbor, even if the absence of the initial and the salamander did not belie completely any attribution to the royal egoist. The present château was in truth—so the owner tells—built for the most part by one Guillaume des Roches, who had been surveyor of the works at Chambord. Upon the death of Francis in 1547, and the consequent relaxing of work on his favorite project, it is said that des Roches brought a few of the hundreds of craftsmen thrown out of employment to build La Morinière. It is probable, moreover, that he was not the first occupant of the site, but that he demolished an earlier medieval castle and based many of his walls on the old foundations. It is even related that the north wing, which is the oldest portion that now exists, was thus built forty years earlier than the rest, in the reign of Louis XII, but it is such an integral part of the whole design, its classic pilasters show so little difference from those of the main building and so much from Louis' work at Blois, that it seems more probable that the demolition and rebuilding all took



SKETCH PLAN.
CHATEAU DE LA MORINIÈRE.
Near Mur-en-Sologne.

place within a relatively short time and under a single presiding mind.

Surely the subtle hand of a true master was never more evident than in the composition of the ensemble. The château proper is disposed about a court, nearly square, in such a way that from each point of view, above all from the front, there is a certain balance, yet this never becomes exact symmetry. The four sides of the court, originally



THE CHATEAU OF LA MORINIÈRE, FROM THE PARK.

at least, were all of unequal height. On the west rises the principal mass, containing the more important rooms, crowned by a pyramidal cupola which is the focus of the entire composition. Along the northern side runs a lower wing for the service, with a small square tower engaged at the outer corner of its eastern gable. The mass thus formed is balanced in the view from the forecourt by the towerlike bulk of the chapel, also square, which occupies the southeastern corner. Connecting these two formerly ran a low gallery of carved wood, with a pavilion in the center, the form of which is still traceable at the end of the bridge. For good or for ill, in 1825, when the chateau came into the hands of the present family, this gallery was removed, leaving only a low parapet such as has always formed the fourth or southerly side. Taken simply by themselves, surrounded as they are by their wide moat, these buildings form a most successful group, which, when the ancient gallery existed to give still further variety to the sides of the court, and, in spite of the easterly entrance, to lend a sense of opening toward the south, must have been still more interesting.

The forecourt and its buildings, for a clearer view of which the gallery was sacrificed, however, supply a perspective and an enclosure which would otherwise be lacking, and render the whole rarely unified and beautiful. Along either side, each returning for some distance across the eastern end, are L-shaped masses of one story, occupied by the stables and farm buildings, with simple hip roofs little broken by dormers or chimneys. At the east, the court so made is closed by a wall pierced only by the main

axial gate of the chateau, but to the west the view is entirely open to the principal group, just across the moat. This is the more true because the forecourt is enough wider than the main court to bring the inner face of its buildings about in line with the outer walls of the chateau, so that the north tower and the chapel are included in the perspective. It results also that the outline of the whole group, stables and moat, is brought to a simple rectangle, and attractive vistas from the west are secured along either side of the moat to the ends of the farm buildings. Added interest is given to these vistas as well as a necessary accent and finish to the farm buildings as seen from other points of view, by four towers, partly disengaged, at the outer corners. Three of these are simply square, but the fourth, the southwestern, is given a

hexagonal shape, and serves as the inevitable dove-cot. Within it one may still see the ladder turning on its central pintle, and the tiers of nests, the original "pigeon-holes," formed in the masonry by tile shelves between vertical ranges of brick, from which the birds, feeding on the corn of neighboring peasants, did their share to help on the Revolution.

The slightly asymmetrical balance which characterizes the general disposition is carried through into the minor membering of the chateau. A close examination will show, for instance, that the forecourt, the bridge, the main doorway, the central dormer, and the cupola are none of them in precisely the same line; and that consequently the main axis is given a freehand character which we to-day confine to our sketches alone, but which we are just being taught to realize the medieval architects consciously strove to



THE CHAPEL AND THE FORECOURT, FROM THE CHATEAU.

preserve in their executed buildings. Again—but little influenced, it seems, by the interior—the designer took care to throw the weight of interest and detail of his façade to the left, where it is needed to assist the mass of the chapel to hold its own against the somewhat heavier wing on the other side. The same subtle principle, which has been happily called *occult* balance, might be traced throughout the buildings of the chateau.

Unlike the profuse and inventive carving of the royal works, the detail of the chateau has not in itself particular interest. To be sure there is a doorway, and a few pilasters and dormers in carved stone, but they serve, like the stone quoining at the angles, rather to give an emphasis and enlivenment to the general design than to attract individual attention. The most characteristic touch is given by the *meurtrières* of the outer walls and towers, which show that the necessity of defense, at least

against casual marauders, had not wholly passed away.

It is not here the sculptured detail that gives the chateau its delightfully intimate and domestic character, but more than anything else the material of the simple walls—brick which from the first must have had a variety of color and a richness of texture which we are but just now once more attaining. To-day, untouched save in a few places where complete decay has forced the reluctant and tender hand of the owner, to whose forbearance many great fissures continue to testify, it has a mellow beauty of patina for which we must still wait on time. In the forecourt the tone of the walls



THE MOAT, LOOKING TOWARD THE CHAPEL AND THE DOVE-COT.

is a rich red orange, gained by the absence of arch-brick, here very sparingly used in the chimneys only, and harmonizing completely with the moss-bronzed tile of the roofs and the red trunks of the Norway pines, which, by a stroke of genius, have been planted where bark and



THE CHATEAU OF LA MORINIÈRE FROM THE FORECOURT.

fired clay alike are flecked with the same atmospheric light and shadow. In the buildings within the moat, on the contrary, there is everywhere a diagonal pattern of darker headers, sometimes almost vanishing and never too evident, which gives just enough tinge of violet-red to prevent the least jar with the purple slates of the roofs—here, like the freer use of stone and carving, indispensable for contrast and accent, and crowning, picturesquely enough, an exterior of the greatest charm.

In the interior, although one may enjoy most the little *cabinet de travail*, littered with works in progress in music, sculpture, painting, and verse, the architectural interest

is, however, confined mainly to the salon and the *salle à manger*.

The original furniture has long been scattered, and there is

little attempt to reproduce its effect exactly, but the complete success of the result, in spite of this, enforces the oft repeated lesson that consistency of period matters little when the pieces are chosen with taste and combined with skill.

Altogether one may well envy the owner his country seat, surrounded as it is by charming landscape and the best coverts

in France, and possessing itself the rare artistry—the poet's poetry—that make above all the delight of an architect.



THE CHATEAU AND THE CHAPEL.



THE SALON — CHATEAU OF LA MORINIÈRE.



FIG. I. AUDITORIUM — THE UNIVERSITY OF ILLINOIS. C. H. Blackall, Architect.

The Use of Sounding-Boards in an Auditorium.

BY F. R. WATSON,
Assistant Professor of Physics, University of Illinois.

SOUNDING-BOARDS are well known because of their use in audience halls where the acoustical properties are unsatisfactory. Thus many churches are found equipped with this device with the expectation that the acoustics will be made better. Because of this common use the author has been led to test sounding-boards of different forms, to determine, if possible, their value in bettering the acoustics of an auditorium.

The experiments were carried out as a part of a more complete investigation of the acoustical properties of the auditorium of the University of Illinois. This auditorium is shaped nearly like a hemisphere with several large arches and recesses to break the regularity of the inner surface. (See Figs. I and IV.) The original plans of the architect were curtailed because the amount of money appropriated for the construction of the building was insufficient for the purpose. The interior of the hall was built absolutely plain with no breaking up of the smooth wall surfaces, and no furnishings were provided in the shape of carpets or curtains. The acoustical properties proved to be unsatisfactory. A reverberation, or undue prolongation of the sound, existed. In addition, echoes are set up because of the large size of the room and because of the position and form of the walls.

A diagnosis of the acoustics was made. The time of reverberation was determined by Sabine's method* to be a little more than six seconds. The echoes were located by tracing out the paths taken by the sound. This was done

by means of an arc-light backed by a parabolic reflector.† The arc gave out sound waves in addition to the light; the two sets of waves traveling together, so that by noting where the light struck a wall, an observer could "see" where the sound traveled. The echoes were finally eliminated by placing canvas curtains so as to break up the sound waves that produced the trouble.

It occurred to the author during the course of the investigation that sounding-boards might be helpful in curing the echoes. Several forms of boards were used. A flat board, about 5 feet square, inclined at an angle above the head of the speaker, produced but little effect. A canvas sheet, about 12 by 20 feet, similarly placed, was also unsatisfactory, although speakers said they could talk better under it than out in the open. Sounding-boards were then used of a parabolic shape, and these produced a pronounced effect.

The sounding-board, or more properly, the reflecting board, was set up at one side of the platform, after the manner of the pulpits in Episcopal churches. (Fig. II.) The shape of the reflector was a quarter section of a paraboloid of revolution with the axis nearly horizontal. The frame was made of wood, and faced on the under side with hard plaster on wire lath. The finished reflector is shown in Fig. III. The results obtained were pronounced. Previous calculations showed that the sound would be directed in such a way as to confine the echoes to a small section of

*W. C. Sabine, "Architectural Acoustics," *American Architect*, 1900.
†F. R. Watson, "Echoes in an Auditorium," *Physical Review*, Vol. 32, page 231, 1911.

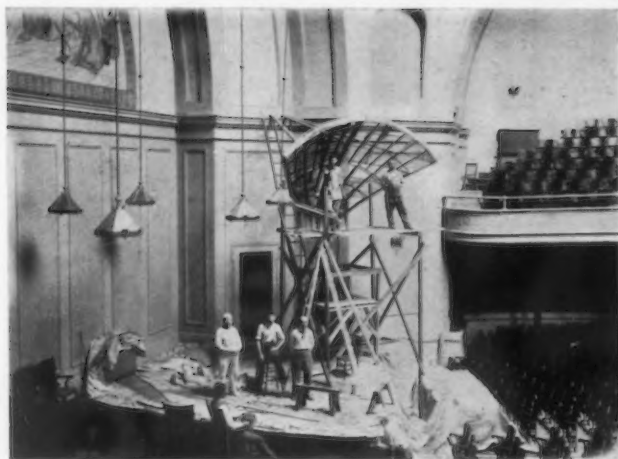


FIG. II. CONSTRUCTION OF REFLECTOR.



FIG. III. COMPLETED REFLECTOR.

the audience. A canvas of the auditors showed this to be the case. Echoes were reported in the section expected, but the remainder of the audience had no such trouble.

Some time later another reflector of the same shape and size was made and mounted over the center of the stage. This was done because speakers regarded the raised pulpit arrangement on the side of the stage as rather formidable. This second frame was much lighter in weight. It was constructed of small wooden rods in a most ingenious way by one of the University carpenters. (See Fig. V.)

It was faced with white oilcloth (see Fig. VI) instead of plaster, since it had been found that the oil cloth was a good reflector of sound and was much lighter in weight. The result obtained by its use confirmed the expectations as in the previous experiment.

Reflectors of this kind have certain objectionable features. Thus, if the mouth of the speaker is at the focus of a paraboloid, the reflected sound goes out in a parallel bundle and only a small portion of the audience gets the reinforced sound. This was found to be so in the two



FIG. IV. INTERIOR OF AUDITORIUM — THE UNIVERSITY OF ILLINOIS.
C. H. Blackall, Architect.

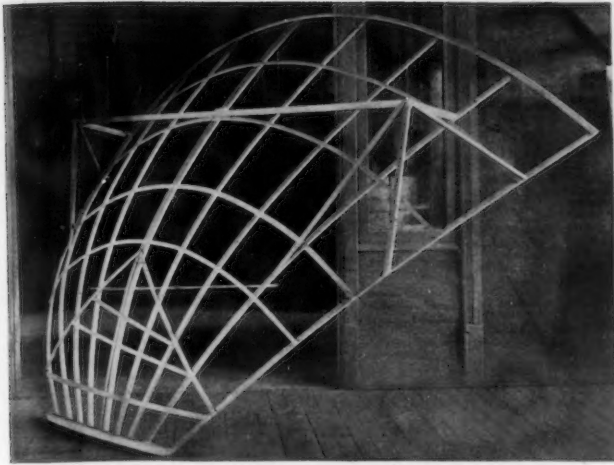


FIG. V. FRAME WORK FOR REFLECTOR.

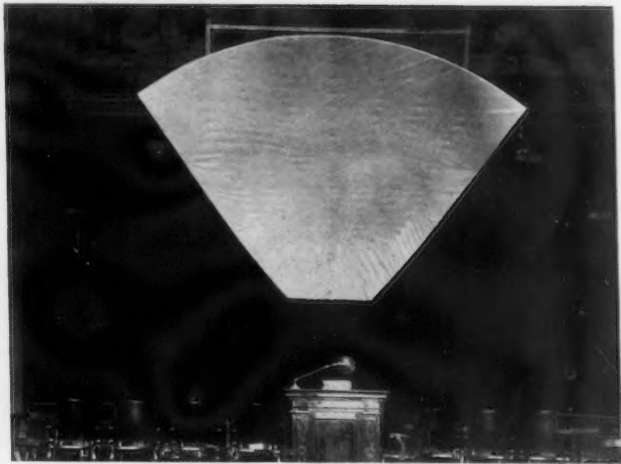


FIG. VI. REFLECTOR OVER PULPIT.

cases cited. Experiments showed the sound to be confined to the region calculated. Auditors in this region reported an increased sound, while others outside this zone had no such reinforcement. To remedy this shortcoming and direct the sound to all the auditors would require a reflector of different form. The results obtained indicate that this could be done by making up a modified parabolic reflector to suit the conditions of the particular case.

One other defect is the annoyance to the speaker. Thus, if his head is near the focus (Fig. VII), he is in a position to get concentrated sound from the audience; i.e., coughing, sneezing, rustling of papers, etc. With the reflectors used, no such annoyance occurred. The two gentlemen who spoke—the Right Reverend Bishop Osborne, who used the reflector at the side of the stage, and Reverend Hugh Black, who used the reflector in the center of the stage—each expressed his satisfaction with the reflector and reported no annoyance in speaking. The steep slope of the reflector eliminated any feeling of being “shut in.” A

speaker standing at the focus is not conscious of the presence of the reflector unless he turns around and looks at it.

The advantages possessed by such a suitably designed reflector are perhaps two in number. First, it serves to cut off the sound which passes to walls that may produce acoustical disturbances, and second, to direct this sound usefully to auditors at a distance from the speaker. Both of these effects were obtained in the auditorium at the University of Illinois. It is not planned to use the reflector at the latter place, since, as already indicated, the echoes can be eliminated by the installation of false walls in the dome. It seems likely that such a reflector would be useful in a hall where the walls could not conveniently be modified. It would be especially adapted for use in churches or halls where the position of the speaker is confined to a small space. *

* See *Architectural Review*, Vol. I., Plate LVIII., December, 1912.

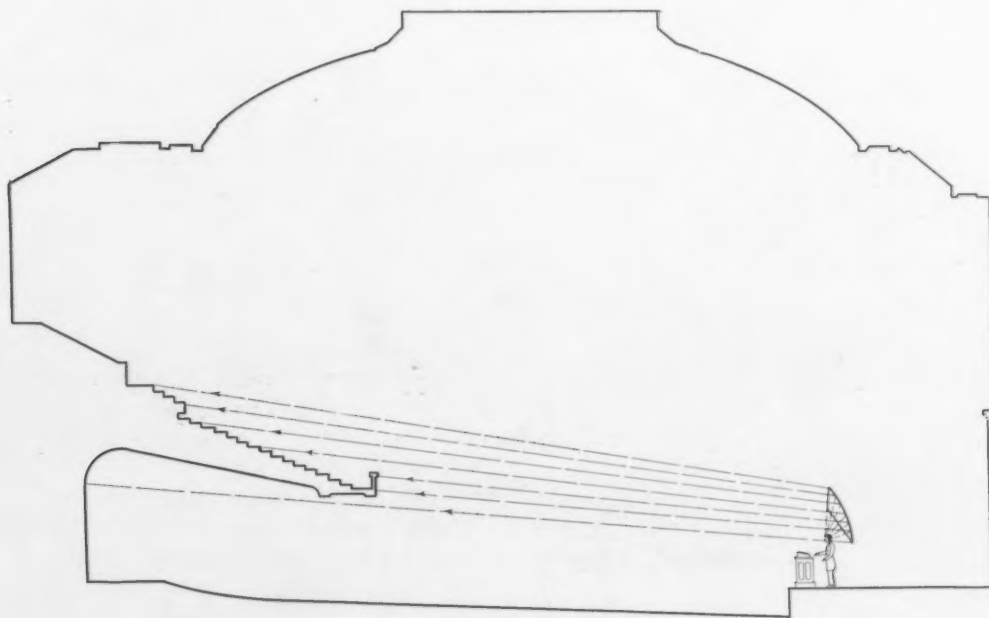


FIG. VII.



BUILDINGS AT SPRING LAKE, N. J.
BRAZER AND ROBB, ARCHITECTS



BUILDING AT CHICAGO, ILL.



BUILDING AT CHICAGO, ILL.

CHATTEN AND HAMMOND, ARCHITECTS



BUILDINGS AT WASHINGTON, D. C. MARSH AND PETER, ARCHITECTS

GROUP OF SMALL MERCANTILE BUILDINGS

EDITORIAL COMMENT AND NOTES FOR THE MONTH



MODERN ARCHITECTURE.

ATERSE and forcible expression of the problem of to-day was read by Mr. Thomas Hastings before the Royal Institute of British Architects. His paper was entitled "Modern Architecture," in the course of which he said: "We American architects are oftentimes confronted with the question as to why we have not an architecture of our own, one which is essentially American; and why it is that so many of us who have studied in Paris seem inclined to inculcate the principles of the École des Beaux-Arts into our American architecture. The majority of people do not seem to realize that in solving problems of modern life the essential is not so much to be national or American as it is to be modern and of our own period."

"The question of supreme interest is: What influence life in its different phases has upon the development of architectural style? Style in architecture is that method of expression in the art which has varied in different periods, almost simultaneously throughout the civilized world, without reference to the different countries, beyond slight differences of national character mostly influenced by climate and temperament. Surely modern architecture should not be the deplorable creation of the would-be style-inventor, or that of the illogical architect living in one age and choosing a style from another."

"The important and indisputable fact is not generally realized that from prehistoric times until now each age has built in one, and only one, style. Since the mound-builders and cave-dwellers, no people, until modern times, ever attempted to adapt a style of a past epoch to the solution of a modern problem; in such attempts is the root of all modern evils. In each successive style there has always been a distinctive spirit of contemporaneous life from which its root drew nourishment. But in our time, contrary to all historic precedents, there is a confusing selection from the past of every variety of style. Why should we not be modern and have one characteristic style expressing the spirit of our own life? History and the law of development alike demand that we build as we live."

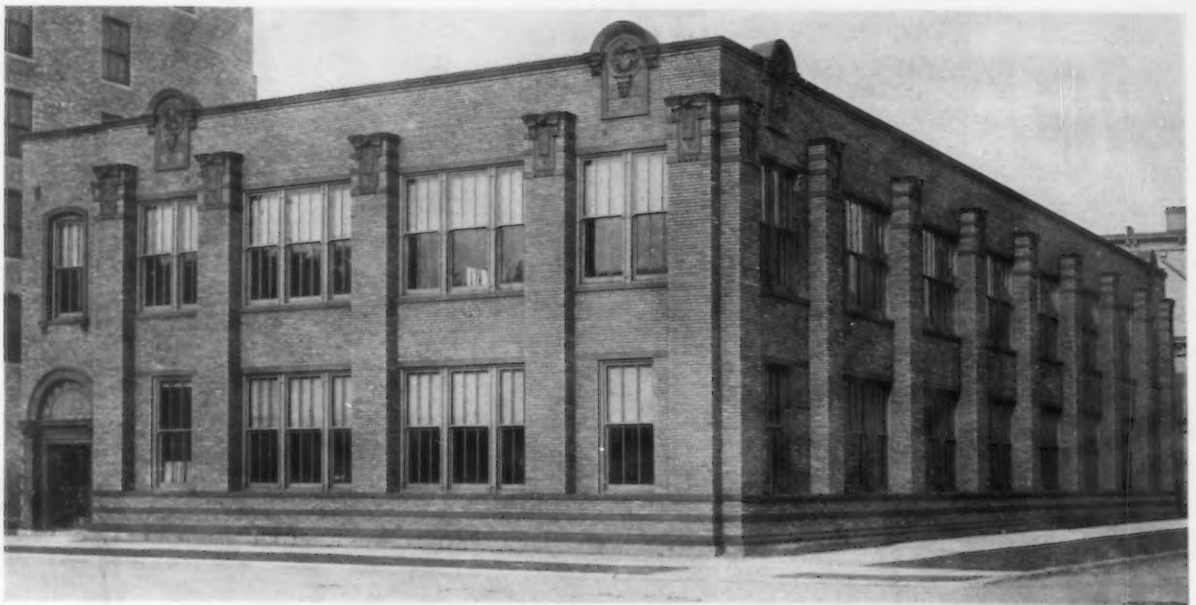
"One might consider the history and development of costumes to illustrate the principle involved. In our dress to-day we are modern but sufficiently related to the past, which we realize when we look upon the portraits of our ancestors of only a generation ago. We should not think of dressing as they did, or of wearing a Gothic robe or a Roman toga; but, as individual as we might wish to be, we should still be inclined, with good taste, to dress according to the dictates of the day."

"Style in its growth has always been governed by the universal and eternal law of development. If from the early times, when painting, sculpture, and architecture were closely combined, we trace their progress through their gradual development and consequent differentiation, we cannot fail to be impressed by the way in which one

style has been evolved from another. This evolution has always kept pace with the progress of the political, religious, and economic spirit of each successive age. It has manifested itself unconsciously in the architect's designs, under the imperatives of new practical problems and of new requirements and conditions imposed upon him. This continuity in the history of architecture is universal. As in nature the types and species of life have kept pace with the successive modifications of lands and seas and other physical conditions imposed upon them, so has architectural style, in its growth and development, until now kept pace with the successive modifications of civilization. For the principles of development should be as dominant in art as they are in nature. The laws of natural selection and of the survival of the fittest have shaped the history of architectural style just as truly as they have the different successive forms of life. Hence the necessity that we keep and cultivate the historic spirit, and that we respect our historic position and relations, and that we more and more realize in our designs the fresh demands of our time, more important even than the demands of our environment."

"Were it necessary, we could trace two distinctly parallel lines — one the history of civilization and the other the history of style in art. In each case we should find a gradual development, a quick succession of events, a revival, perhaps almost a revolution and a consequent reaction, always together like cause and effect, showing that architecture and life must correspond. In order to build a living architecture we must build as we live. Compare the Roman Orders with the Greek and with previous work. When Rome was at its zenith in civilization the life of the people demanded of the architect that he should not only build temples, theaters, and tombs, but baths, palaces, basilicas, triumphal arches, commemorative pillars, aqueducts, and bridges. As each of these new problems came to the architect it was simply a new demand from the new life of the people — a new work to be done. When the Roman architect was given such varied work to do, there was no reason for his casting aside all precedent. While original in conception, he was called upon to meet these exigencies only with modifications of the old forms. These modifications very gradually gave us Roman architecture."

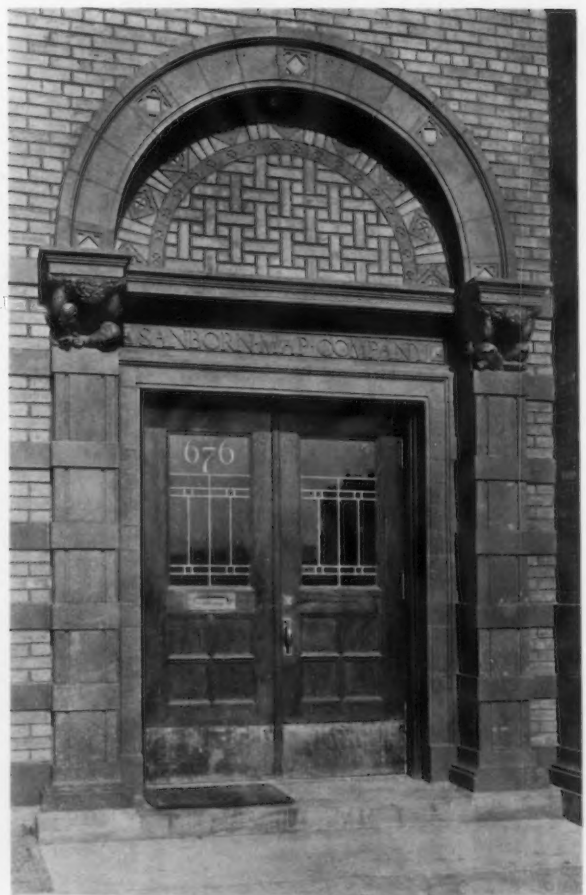
"Compare a workman of to-day, building a Gothic church, slavishly following his detail drawings, with a workman of the fourteenth century doing such detail work as was directed by the architect, but with as much interest, freedom, and devotion in making a small capital as the architect had in the entire structure. Perhaps doing penance for his sins, he praises God with every chisel-stroke. His life interest is in that small capital; for him work is worship, and his life is one continuous psalm of praise. The details of the capital, while beautiful, may be gro-



MAIN ELEVATIONS.



DETAIL



ENTRANCE DETAIL

COMMERCIAL BUILDING, CHICAGO, ILL.

PERKINS, FELLOWS AND HAMILTON, ARCHITECTS.

tesque; but there is honest life in them. To imitate such a capital to-day without that life would be affectation. Now a Gothic church is built by laborers whose one interest is to increase their wages and diminish their working hours. The best Gothic work has been done, and cannot be repeated. When attempted it will always lack that kind of medieval spirit of devotion which is the life of medieval architecture.

"So great were the changes in thought and life during the Renaissance period that the forms of architecture which had prevailed for a thousand years were inadequate to the needs of the new civilization; to its demands for greater refinement of thought; for larger truthfulness to nature; for less mystery in form of expression, and for greater convenience in practical living. Out of these necessities of the times of the Renaissance style was evolved—taking about three generations to make the transition—and around no other style have been accumulated such vast stores of knowledge under the lead of the great masters of Europe. Therefore whatever we now build, whether church or dwelling, the law of historic development requires that it be Renaissance; and if we encourage the true principles of composition it will

involuntarily be a modern Renaissance; and with a view to continuity we should take the eighteenth century as our starting-point, because here practically ended the historic progression and entered the modern confusion.

"In every case where the medieval style has been attempted in modern times the result has shown a want of life and spirit, simply because it was an anachronism. The result has always been dull, lifeless, and uninteresting. It is without sympathy with the present or a germ of hope for the future—only the skeleton of what once was. We should study and develop the Renaissance and adapt it to our modern conditions and wants so that future generations can see that it has truly interpreted our life. We can interest those who come after us only as we thus accept our true historic position and develop what has

come to us. We must accept and respect the traditions of our fathers and grandfathers and be, as it were, apprenticed by their influence. Without this we shall be only copyists or be making poor adaptations of what was never really ours.

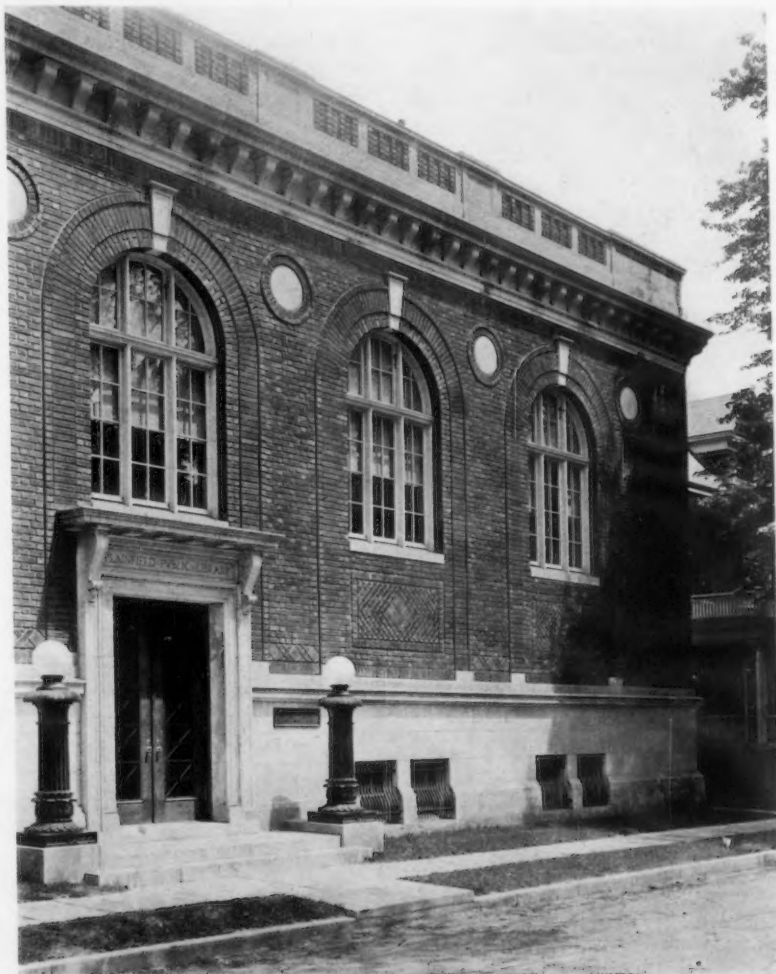
"The time must come, and I believe in the near future, when architects of necessity will be educated in one style, and that will be the style of their own time. They will be so familiar with what will have become a settled conviction, and so loyal to it, that the entire question of style,

which at present seems to be determined by fashion, fancy, or ignorance, will be kept subservient to the great principles of composition, which are now more or less smothered in the general confusion.

"Whoever demands of an architect a style not in keeping with the spirit of his time is responsible for retarding the normal progress of the art. We must have a language if we would talk. If there be no common language for a people there can be no communication of ideas either architectural or literary. I am convinced that the multiplicity of printed books and periodicals written by literary critics and essayists who have not even been apprenticed, but are writing with authority about art, has

perhaps been more instrumental than anything else in bringing about this modern confusion. I believe that we shall one day rejoice in the dawn of a modern Renaissance, and, as always has been the case, we shall be guided by the fundamental principles of the classic. It will be a modern Renaissance, because it will be characterized by the conditions of modern life. It will be the work of the Renaissance architect solving new problems, adapting his art to an honest and natural treatment of new materials and conditions. Will he not also be unconsciously influenced by the twentieth-century spirit of economy and by the application of his art to all modern industries and speculations?

"We must logically interpret the practical conditions before us, no matter what they are. No work to be done is ever so arbitrary in its practical demands, but that the



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Wilder & White, Architects.

art is elastic and broad enough to give these demands thorough satisfaction in more than a score of different ways. If only the artist will accept such practical imperatives as are reasonable, if only he will welcome them, one and all, as friendly opportunities for loyal and honest expression in his architecture, he will find that these very conditions will do more than all else besides for his real progress and for the development of contemporaneous art in composition.

"The architects in the early history of America were distinctly modern and closely related in their work to their contemporaries in Europe. They seem not only to have inherited traditions, but to have religiously adhered to them. I believe that it is because of this that the genuine and naïve character of their work, which was of its period, still has a charm for us which cannot be imitated. McComb, Bulfinch, Thornton, Latrobe, L'Enfant, Andrew Hamilton, Strickland, and Walters were sufficiently American and distinctly modern, working in the right direction, unquestionably influenced by the English architecture of Inigo Jones, Sir Christopher Wren, James Gibbs, Sir William Chambers. Upjohn and Renwick, men of talent, were misled, alas, by the confusion of their times, the beginning of this modern chaos, the so-called Victorian-Gothic period.

"Gifted as Richardson was, and great as his personality was, his work is always easily distinguished, because of its excellent quality, from the so-called Romanesque of his followers. But I fear the good he did was largely undone because of the bad influence of his work upon his profession. Stumpy columns, squat arches, and rounded corners, without Richardson, form a disease from which we in America are only just recovering. McComb and Bulfinch would probably have frowned upon Hunt for attempting to graft the transitional Loire architecture of the fifteenth century upon American soil, and I believe all will agree that the principal good he accomplished was due to the great distinction of his art and the moral character of the man himself, rather than to the general influence and direction of his work.

"Whether we agree with Charles F. McKim or not in wanting to revive in the nineteenth century the art of Bramante, St. Gato, and Peruzzi, he had perhaps more of the true sense of beauty than any of his predecessors, in American art. His work was always refined, personal, and with a distinctly more classic tendency in his most recent buildings.

"It is, I believe, a law of the universe that the forms of life which are fittest to survive — nay, the very universe itself — are beautiful in form and color. Natural selection is beautifully expressed, ugliness and deformity are synonymous; and so in the economy of life what would survive must be beautifully expressed.

"When we think of what the past ages have done for us, should we not be more considerate of those that are yet to come? A great tide of historic information has constantly flowed through the channel of monuments erected by successive civilizations, each age expressing its own life, and we can almost live in the past through its monuments.

The recently-discovered buried cities of Assyria give us a vivid idea of a civilization lost to history. The Pyramid of Cheops and the Temples of Karnak and Luxor tell us more of that ingenuity which we cannot fathom, and the

grandeur of the life and history of the Egyptian people, than the scattered and withered documents or fragments of inscriptions that have chanced to survive the crumbling influences of time. The Parthenon and the Erechtheum bespeak the intellectual refinement of the Greeks as much as their epic poems or their philosophy. The triumphal arches, the aqueducts, the Pantheon, and the basilicas of Rome tell us more of the great constructive genius of the early republic and the empire of the Cæsars than the fragmentary and contradictory annals of wars and political intrigues.

"The unsurpassed and inspiring beauty of the Gothic cathedrals which bewilder us, and the cloisters which enchant us, impress on our minds a living picture of the feverish and morbid aspiration of medieval times — a civilization that must have mingled with its mysticism an intellectual and spiritual grandeur which the so-called Dark Ages of the historian have failed adequately to record; and in America, even amid the absorbing work of constructing a new government, our people found time to speak to us to-day in the silent language of their simple architecture of the temperament and character of our forefathers.

"Will our monuments of to-day adequately record the splendid achievements of our contemporaneous life — the spirit of modern justice and liberty, the progress of modern science, the genius of modern invention and discovery, the elevated character of our institutions? Will disorder and confusion in our modern architecture express the intelligence of this twentieth century? Would that we might learn a lesson from the past — that modern architecture, wherever undertaken, might more worthily tell the story of the dignity of this great epoch and be more expressive of this wonderful contemporaneous life."

AN ARCHITECT AS PRESIDENT.

FOR the first time since the organization, in 1896, of the National Fire Protection Association, its president is not identified with the fire insurance business. This innovation signifies the intent to broaden the influence of the association. The new president, Robert D. Kohn, is an architect of prominence in his profession and president of the New York Chapter of the American Institution of Architects. The architect can be a powerful agent for good in the movement for fire prevention, but at present he is an undeveloped force, says the Insurance Press.

THE Supreme Court of Illinois has upheld the legality of the architects' license law of Illinois in a test suit brought by David Saul Klafter.

CHINESE scholars have formulated a new alphabet, after a study of all the alphabets of the world, which will supersede, it is said, the cumbersome ideograms which were the pride of the ancient Chinese, as well as the puzzle of the modern world. Five vowels have been taken from the Latin, four from the Greek, four from the Russian, one from the Chinese, and two are elongated signs and seven are reversed ideograms. Fourteen consonants are Latin, three Russian, and two Greek. With these it is declared to be possible to write all the words used in any part of China. An effort is to be made at once to introduce the new alphabet into official circles.